AD-A153 206 SURVEILLANCE REPORT STAGE I DISSECTED MOTORS/ PROPELLANTS MOTOR NUMBER 00..(U) OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS LA.. 1/2

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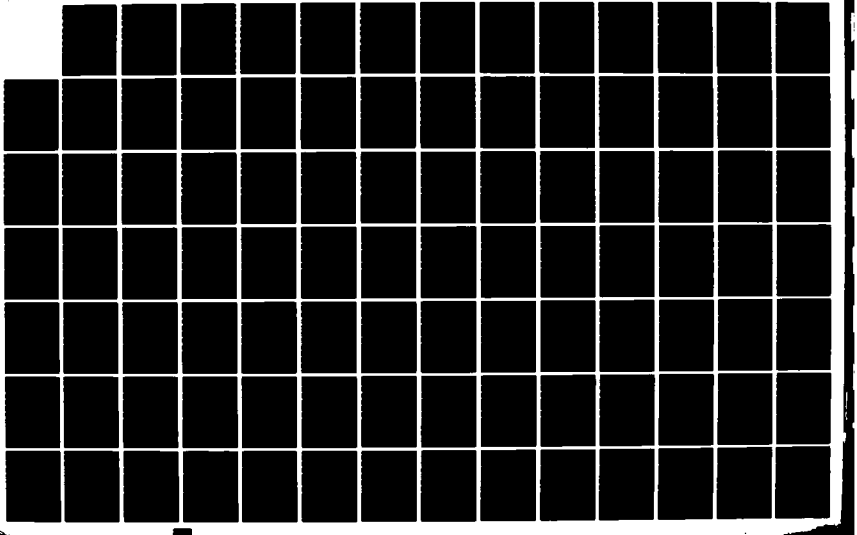

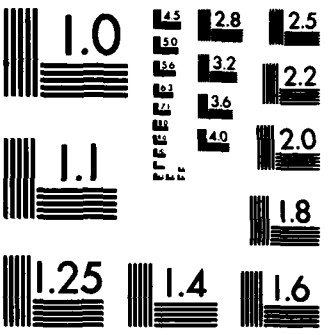

HEADQUARTERS

OGDEN AIR LOGISTICS CENTER

UNITED STATES AIR FORCE

HILL AIR FORCE BASE, UTAH 84056-5149

SURVEILLANCE REPORT
STAGE I
DISSECTED MOTORS/PROPELLANTS
MOTOR NUMBER 0012199
PHASE XV

PROPELLANT ANALYSIS LABORATORY

MANPA REPORT NR
503(85)

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MMWRM PROJECT M46288C

SURVEILLANCE REPORT

STAGE I DISSECTED MOTORS

PHASE XV PROPELLANT & COMPONENT TESTING

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ABSTRACT

Testing was performed to determine the useful shelf/service life for LGM-30, Stage I ~~Rocket Motors~~, A three year storage program for propellant and components was started in May 1961. This program was then extended to a ten year study and later continued indefinitely to assure that a deterioration in motor physical characteristics could be detected in time to take some corrective actions before the weapon system performance deteriorated below an acceptable level.

This report covers propellant test data for motor S/N 0012199. Planned dissection of selected motors in the future will provide samples for continued component testing.

The data is presented in the form of regression analysis and the trends are projected 24 months beyond the last test date.

From the statistical analysis of all data tested to date, significant degradation of the propellant does not appear likely for at least two years past the oldest data point.

Future testing and reporting will be conducted on individual dissected motors.

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GLOSSARY OF TERMS AND ABBREVIATIONS

Aging Trend	A change in properties or performance resulting from aging of material or component
CSA	Cross Sectional Area
DB	Dogbone
Degradation	Gradual deterioration of properties or performance
E	Modulus (psi), defined as stress divided by strain along the initial linear portion of the curve.
EB	End Bonded
EGL	Effective Gage Length
em	Strain at maximum stress
er	Strain at rupture
"F" ratio	The ratio of the variance accounted for by the regression function to the random unexplained variance. The regression function having the most significant "F" ratio is used for plotting data. The ratio is also used in detecting significant changes in random variation between succeeding time points
JANNAF	Joint Army, Navy, NASA, Air Force Committee
MANPA	Propellant Lab Section at Ogden Air Logistics Center
Ogden ALC	Ogden Air Logistics Center, Air Force Logistics Command
r or R	The Correlation Coefficient is a measure of the degree of closeness of the linear relationship between two variables
Regression Equation	The general form of the regression equation is $Y = a + bx$
Regression Line	Line representing mean test values with respect to time
S_b	Standard error of estimate of the regression coefficient

GLOSSARY OF TERMS AND ABBREVIATIONS (cont)

S_e or $S_{Y.X}$	Standard deviation of the data about the regression line
Sm	Maximum Stress
Sr	Stress at rupture
Standard Deviation (S_y)	Square root of variance
Strain Rate	Crosshead speed divided by the EGL
"t" test	A statistical test used to detect significant differences between a measured parameter and an expected value of the parameter (determines if regression slope differs from zero at the 95% confidence level)
Variance	The sum of squares of deviations of the test results from the mean of the series after division by one less than the total number of test results
3 Sigma Band	The area between the upper and lower 3 sigma limit. It can be expected that 99.73% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed.
90-90 Band	It can be stated with 90% confidence that 90% of the inventory represented by the test samples would fall within this range assuming that the population is normally distributed

INTRODUCTION

A. PURPOSE:

This report contains test data from samples of LGM-30 Stage I, Wing II TP-H1011 propellant obtained from dissected motor S/N 0012199. Testing was performed by the Propellant Analysis Laboratory (MANPA) for the Minuteman Motor Engineers (MMGR) under Project M46288C. This report is the fifteenth in this series. Data from this test period and propellant test data from the fourteen previous reports, for motor S/N 0012199, were entered into the G085 computer for regression analysis. The regressions are shown in this report.

B. TEST PROGRAM:

The LGM-30 laboratory and component program includes the testing of materials used in the main case and main grain propellant. Table 1 outlines the test program.

C. HISTORICAL BACKGROUND:

In May 1961, Thiokol began a three year LGM-30 laboratory storage and test program to determine the rate of degradation with age for Stage I materials. During June 1962 and again in August 1963, additional samples were included. New samples were added in July and August 1964 when the surveillance test program was extended to ten years (Test Plan 0717-62-0967, 53-8). The samples added to the inventory in 1964 were considered to be a new population, but were combined in regression analysis with the three dissected motors.

The history of testing of these materials is found in MQQP Report Nrs. 109A(67), 144(68), 208(71), MANCP Report Nr. 358(76) and MANPA Report Nr. 482(82). Physical transfer of the specimens from Thiokol to Ogden ALC was made in June 1967.

Until 1982, due to a limited number of dissected motor samples, data from all motors were combined for statistical analyses. In 1982, key LRSLA parameters were reported for individual motors (MANPA Report Nr. 470(82).

STATISTICAL ANALYSIS

The objective of this statistical analysis is to determine the effect aging has on Stage I propellant from motor S/N 0012199. This analysis will assist Service Engineering in predicting Stage I serviceability.

The method used to accomplish this analysis was regression analysis. The linear equation $Y = a + bX$ was found to be the best fit model for this data. The unique mathematical regression equations are on the top of each plot. Each point on a regression plot represents a data mean value at its particular age at test. The sample sizes for the mean values may vary in the number of specimens tested at each test period. The sample size at a particular test period can be found in the Sample Size Summaries. All regressions are calculated on individual data values.

The variance about each regression trend line was used to compute a tolerance interval such that at 90% confidence 90% of the sample distribution will fall within this interval. This tolerance interval is extrapolated 24 months beyond the age of the last test date.

The 't' value and the significance of this statistic will be given as an indication of the "statistical significance" of the slope of the trend lines as it is compared to a line of zero slope. When a regression slope is labeled as significant, it should be noted that the slope of the trend line is significant from a statistical standpoint and a change over time is occurring. A significant indication does not necessarily mean that the change in test values obtained during testing is significant in regards to motor fleet operational performance.

In 1961, a program was undertaken to determine the rate of degradation for the propellant used in Stage I Minuteman Motors (TP-H1011). With the use of TP-H1011 propellant, obtained from dissected Stage I motors, a normal distribution population was assumed for each motor and the data from

three motors (0012099, 0012199, and STM 012) were statistically combined. The combined data has been analyzed using a multi-symbol regression program that displays unique plot codes for each motor. This method of data plotting allows a visual display of the overall relationship between motors and their relationship with the combined least squared aging trend line. The combined motor composite regressions indicate that data masking of individual motor trends may be inprocess and a closer investigation is required.

Each dissected motor will be individually analyzed using linear regressions. The individual motor regressions were then analyzed for compatibility using the Analysis of Covariance. At this time, using the 5% significance level, these three motors are not statistically combinable.

As previously recommended, each motor will be individually plotted and analyzed to eliminate errors and provide more accurate regressions.

This report contains data and analysis for motor S/N 0012199. The analysis will be based on this motor only. The regression summaries can be found in table 2. The three motor combined composite regression plots, which also included motor S/N 0012199, has also been included to allow a visual display of the overall relationship between motors (results can also be found in table 2). The combined motor regressions should not be used for any purpose other than visual display only.

The symbols used for each of the three motors are as follows:

0012099 = 0

0012199 = 1

STM-012 = S

TABLE 1

TEST PROGRAM

Test	Conditions	Config-uration	Nr Specimen	Total Specimens
Tensile, Low Rate	77°, 2 & 20 in/min	JANNAF Dogbone	5	40
Creep	77°, 10 & 12 lb Load	JANNAF Dogbone	3	24
Stress Relaxation	77°, 3 & 5% Strain	1/2"x1/2"x4"	3	24
Hardness	77°, Init & 10 sec	Dogbone Ends	5	40
HOE	77°	1/2"x3/8"x1"	5	40
DTA	77° Start	0.040" Wafers	3	12
Sol Gel	77°	1/2"x1/2"x1/2"	6	24
High Rate Tensile	77°, 1000 in/in/min	3/4" GL Dogbones	5	15
Triaxial High Rate	77°, 1000 in/in/min	3/4" GL Rail	3	9
Dynamic Response	77°, 70 gm ct. wt.	3.3"x.33"x690" Disc	3	9
Biaxial Constant Strain	77°	3/4" GL Rail	3	9
Tear Energy	77°F ± 2°	0.1"x1.18"x3"	8	16
Poisson's Ratio (Strain Dilatation) 10, 15, 20, 25, 30%	77°F ± 2°	0.50"x0.50"x4"	6	30

TEST RESULTS

Regression analysis is the method of evaluation used in the analysis of motor S/N 0012199 test results. The regressions are presented in this report. In addition, regressions for the three dissected motors combined are presented in this report for visual comparison only to motor S/N 0012199.

A. TENSILE:

1. Low Rate Tensile (2.0 in/min):

The strain at maximum stress and strain at rupture trend lines show a statistically significant gradual decrease (figures 1 and 3). Maximum stress, stress at rupture and modulus regression trend lines show statistically significant increases (figures 2, 4 and 5).

For the dissected motor relationship (combined data) the respective regressions are included (figures 1A thru 5A).

2. Low Rate Tensile (20.0 in/min):

Strain at maximum stress and strain at rupture trend lines show a statistically significant decrease (figures 6 and 8). Maximum stress, stress at rupture and modulus show a statistically significant increase in the trend line direction (figures 7, 9 and 10).

The combined regressions are shown in figures 6A through 10A.

3. High Rate Tensile (1000 in/in/min):

The strain at maximum stress regression trend line shows a statistically significan_ increase (figure 11). Strain at rupture, maximum stress and stress at rupture regressions show a non-significant trend line (figures 12, 13 and 14). A statistically significant decreasing trend line direction for modulus is seen in figure 15.

The combined respective regressions are shown in figures 11A thru 15A.

4. High Rate Triaxial Tensile at 600 psi (1000 in/in/min):

The maximum stress and stress at rupture regression trend lines show a statistically significant increase (figures 17 and 19). The remaining regressions have a non-significant trend direction (figures 16, 18 and 20).

The respective combined regressions are shown in figures 16A thru 20A.

B. CREEP:

All of the regressions for the ten pound load test demonstrates a non-significant trend direction (figures 21 thru 24).

For the 12 pound load test at 10, 20 and 1000 second testing, also demonstrate a non-significant trend direction (figures 25, 26 and 27).

The respective combined motor regressions are shown in figures 21A thru 27A.

C. STRESS RELAXATION:

The stress relaxation modulus for the 3% and 5% strains show a statistically significant trend in the increasing direction for 10, 50, 100 and 1000 seconds (figures 28 thru 35).

The respective combined motor data regressions are shown in figures 28A thru 35A.

D. CONSTANT STRAIN:

The regression trend line has a non-significant slope direction (figure 36).

The combined motor data regression is shown in figure 36A.

E. HARDNESS:

The Shore A 10 second hardness regression trend line has a non-significant direction (figure 37).

The combined motor data regression is shown in figure 37A.

F. TEAR ENERGY:

The tear energy regression shows a non-significant trend direction (figure 38).

The combined motor data regression is shown in figure 38A.

G. SOL GEL:

The crosslink density and percent extractables have significant positive direction trend lines (figures 39 and 40). The gel swell ratio (figure 41) shows a non-significant trend direction and the density has a statistically significant negative trend line direction (figure 42).

The respective regressions for the combined motor data are shown in figures 39A thru 42A.

H. HEAT OF EXPLOSION:

The trend line for the regression is non-significant (figure 43).

The respective regression for the combined motor data is shown in figure 43A.

I. BURNING RATE:

The burning rate at 500 psi test pressure shows a statistically significant increasing trend line direction (figure 44). The regression for the 1000 psi shows a non-significant trend line direction (figure 45).

The respective regressions for the burning rate combined motor data are shown in figures 44A and 45A.

J. FAILURE ENVELOPE:

The failure envelope for motor S/N 0012199 is shown in figure 46.

TABLE 2

REGRESSION TREND LINE SUMMARY

Test	Motor 0012199	Composite Motor
Low Rate Tensile, 77°F, 2.0 in/min		
Strain at Max Stress	S(-)	NS
Maximum Stress	S(+)	S(+)
Strain at Rupture	S(-)	NS
Stress at Rupture	S(+)	S(+)
Modulus	S(+)	NS
Low Rate Tensile, 77°F, 20.0 in/min		
Strain at Max Stress	S(-)	S(-)
Maximum Stress	S(+)	S(-)
Strain at Rupture	S(-)	S(-)
Stress at Rupture	S(+)	NS
Modulus	S(+)	NS
High Rate Tensile, 77°F, 1750 in/in/min		
Strain at Max Stress	S(+)	NS
Maximum Stress	NS	NS
Strain at Rupture	NS	S(-)
Stress at Rupture	NS	NS
Modulus	S(-)	S(-)
High Rate Triaxial Tensile, 77°F, 1750 CHS, 600 psi		
Strain at Max Stress	NS	S(+)
Maximum Stress	S(+)	S(+)
Strain at Rupture	NS	S(+)
Stress at Rupture	S(+)	S(+)
Modulus	NS	S(-)
Creep, 10 lb Load, 10 sec	NS	S(-)
20 sec	NS	S(-)
1000 sec	NS	S(-)
10,000 sec	NS	S(-)
Creep, 12 lb Load, 10 sec	NS	S(-)
20 sec	NS	S(-)
1000 sec	NS	S(-)
Stress Relaxation, 3% Strain, 10 sec	S(+)	S(+)
50 sec	S(+)	S(+)
100 sec	S(+)	S(+)
1000 sec	S(+)	NS
Stress Relaxation, 5% Strain, 10 sec	S(+)	S(+)
50 sec	S(+)	S(+)
100 sec	S(+)	S(+)
1000 sec	S(+)	NS

TABLE 2 (cont)

Test	Motor 0012199	Composite Motor
Constant Strain	NS	S(-)
Hardness, Shore A, 77°F, 10 sec	NS	S(-)
Sol Gel		
Crosslink Density	S(+)	NS
% Extractables	S(+)	S(+)
Weight Swell Ratio	NS	S(+)
Density	S(-)	S(-)
Heat of Explosion	NS	S(+)
Burning Rate, 500 psi	S(+)	NS
1000 psi	NS	S(-)

NS = Non-significant trend from a line of zero slope

\+ = Significant slope in a positive direction

\- = Significant slope in a negative direction

NOTE: All testing performed at the 5% significance level

SUMMARY

A. TENSILE, CREEP, STRESS RELAXATION AND CONSTANT STRAIN:

For those regressions where statistically significant trend line direction are seen, the changes are gradual and no problems are indicated. The propellant has shown less strain capability and higher tensile strength as the age increases.

B. HARDNESS AND CROSSLINK DENSITY:

The hardness and crosslink density is gradually increasing as the propellant ages. As the crosslinking continues, the propellant becomes more rigid. This correlates well with increasing hardness, decreasing strain and greater stress properties.

C. THERMAL AND COMBUSTION PROPERTIES:

From the analysis, the thermal properties are not undergoing any drastic changes at this time with respect to age.

CONCLUSIONS AND RECOMMENDATIONS

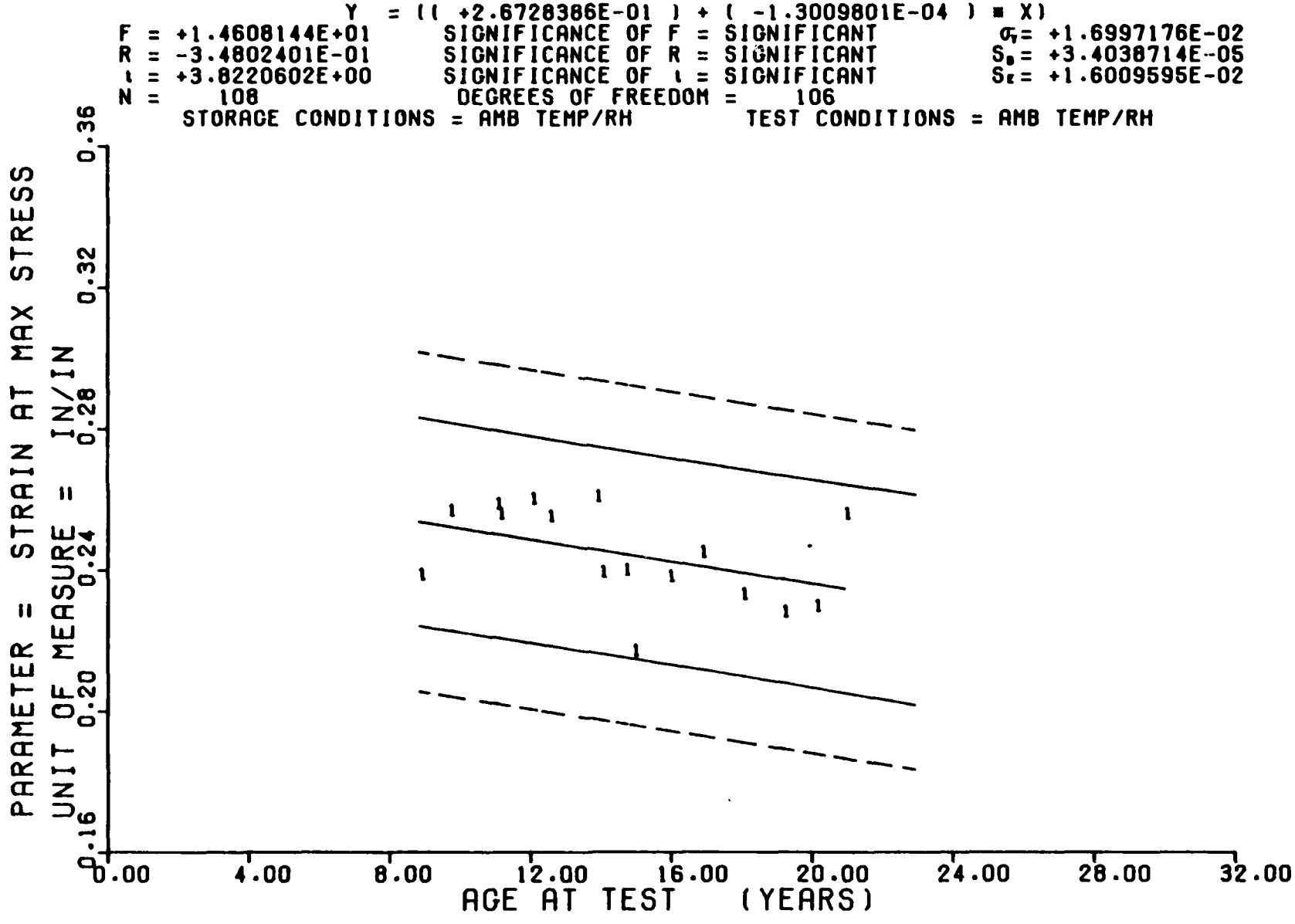
A. CONCLUSIONS:

1. The test results show that, under present storage conditions, some of the physical and combustion properties of the propellant indicate statistically significant aging trends. However, where a significant trend is indicated, the slope of the trend line is gradual and no operational problems are expected for at least two years beyond the last test period.

2. Although some aging trends have been observed, it does not appear that significant degradation will occur in the propellant within the next two years.

B. RECOMMENDATIONS:

It is recommended that testing and reporting be continued on propellant from motor S/N 0012199 on an individual basis to eliminate the biasing created by combined motor regressions.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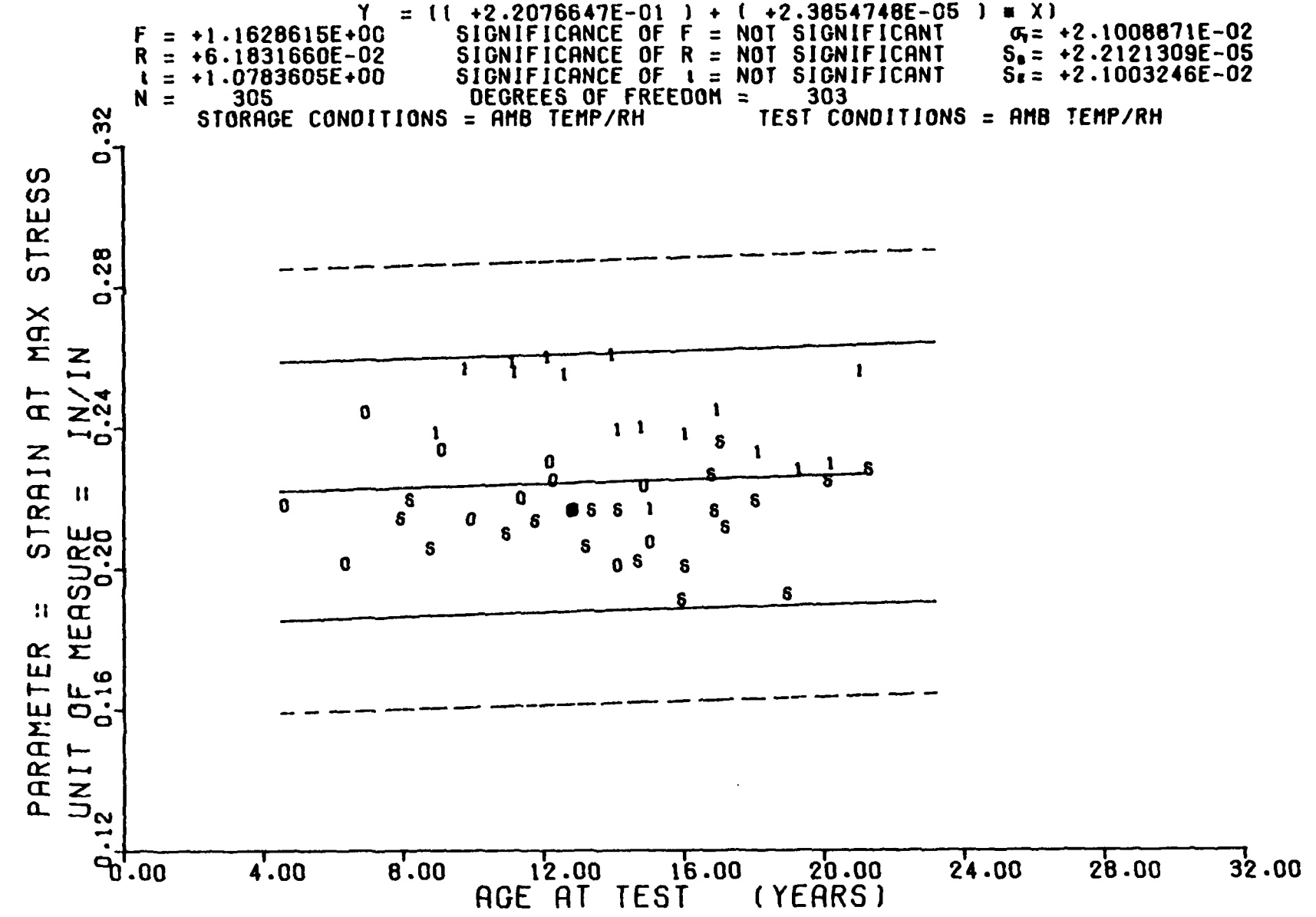
R = -3.4802401E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +3.8220602E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 108 DEGREES OF FREEDOM = 106
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.36
0.32
0.28
0.24
0.20
0.16
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTOR=0012199.LOW RATE CHS=2.0 IN/MIN.STRAIN MAX STRESS

Figure 1



STAGE 1 DISSECTED MOTORS,LOW RATE CHS=2.0 IN/MIN,STRAIN MAX STRESS

Figure 1A

*** [illegible] ANALYSIS ***

*** ANALYSIS OF [illegible] ***

[illegible]	[illegible]	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
[illegible]	[illegible]	[illegible]E-01	[illegible]	[illegible]E-01	+2.21[illegible]94E-01	+2.534[illegible]342E-01
[illegible]	[illegible]	[illegible]E-01	[illegible]	[illegible]E-01	+2.43[illegible]95E-01	+2.521924[illegible]E-01
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[illegible]	[illegible]	[illegible]E-01	+1.70[illegible]	[illegible]E-01	+2.2[illegible]E-01	+2.4[illegible]E-01
[illegible]	[illegible]	[illegible]E-01	[illegible]	[illegible]E-01	+2.400[illegible]E-01	+2.4854[illegible]E-01
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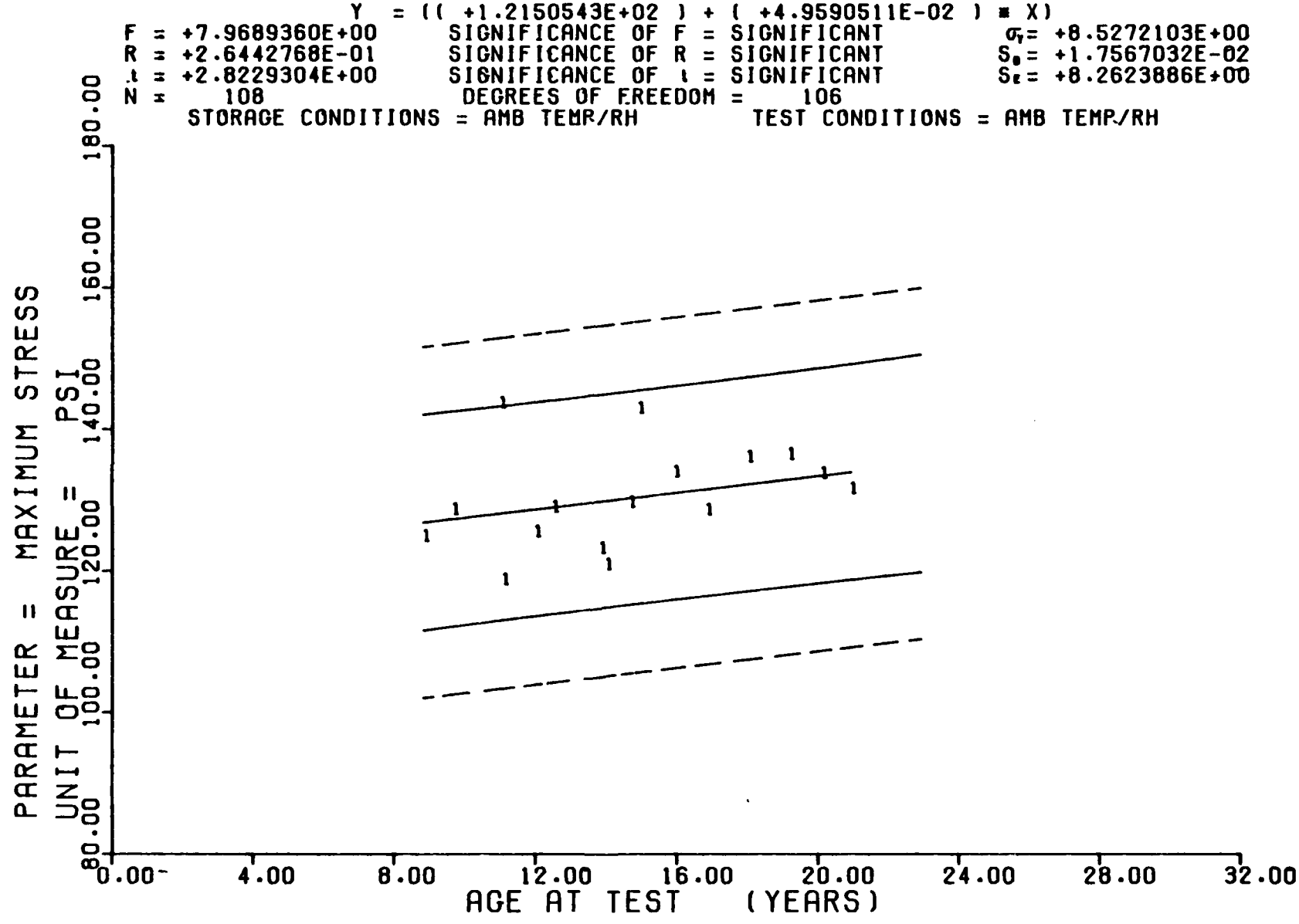
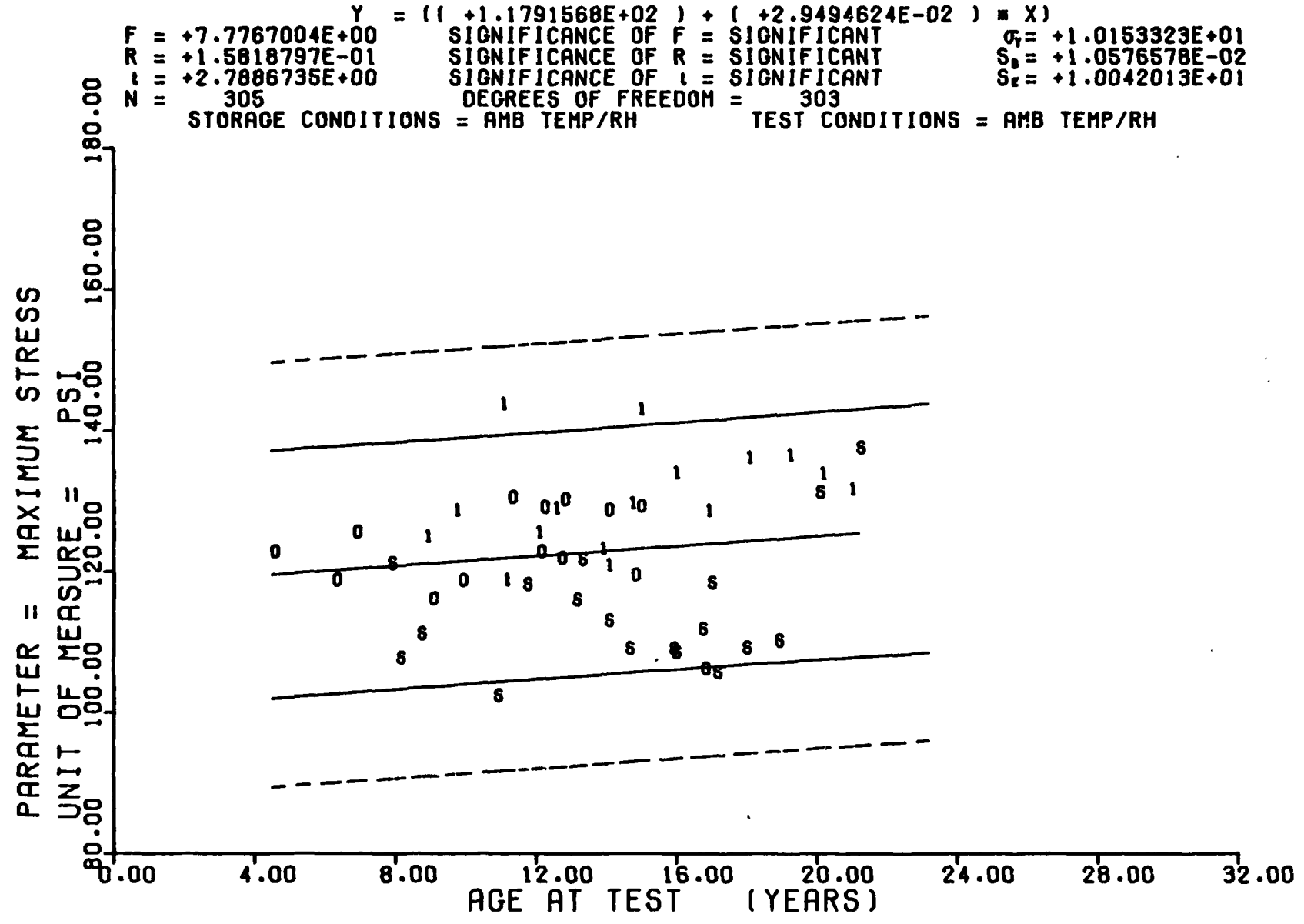
[illegible] MAX STRESS



STAGE 1.DISSECTED MOTOR=0012199 LOW RATE CHS=2.0 IN/MIN.MAXIMUM STRESS.

Figure 2



STAGE 1 DISSECTED MOTORS,LOW RATE (AS=2.0 IN/MIN,MAXIMUM STRESS

Figure 2A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+1.2419999E+02	+4.7116875E+00	+1.2800000E+02	+1.1600000E+02	+1.2676202E+02
116.0	5	+1.2800000E+02	+2.8284271E+00	+1.3300000E+02	+1.2600000E+02	+1.2725791E+02
132.0	9	+1.4302323E+02	+1.5599791E+00	+1.4548999E+02	+1.4110998E+02	+1.2805137E+02
133.0	10	+1.1808496E+02	+1.2756730E+01	+1.3460998E+02	+1.0400000E+02	+1.2810096E+02
144.0	5	+1.2485189E+02	+4.5344989E-01	+1.2520999E+02	+1.2412998E+02	+1.2864645E+02
150.0	8	+1.2835241E+02	+2.7744090E+00	+1.3153999E+02	+1.2439999E+02	+1.2894400E+02
166.0	5	+1.2251591E+02	+2.0232536E+00	+1.2544999E+02	+1.2055999E+02	+1.2973744E+02
168.0	3	+1.2019326E+02	+2.7322975E+00	+1.2327999E+02	+1.1809999E+02	+1.2983662E+02
176.0	3	+1.2901992E+02	+4.0229006E+00	+1.3303999E+02	+1.2500000E+02	+1.3023335E+02
179.0	5	+1.4228988E+02	+2.9551797E+00	+1.4488999E+02	+1.3736999E+02	+1.3038212E+02
191.0	8	+1.3332864E+02	+3.4865955E+00	+1.3782998E+02	+1.2877999E+02	+1.3097721E+02
202.0	8	+1.2796246E+02	+5.9602999E+00	+1.3819999E+02	+1.2009999E+02	+1.3152270E+02
216.0	8	+1.3545614E+02	+2.5353801E+00	+1.3852999E+02	+1.3007998E+02	+1.3221697E+02
230.0	8	+1.3582617E+02	+3.9676508E+00	+1.4368998E+02	+1.3298999E+02	+1.3291123E+02
241.0	8	+1.3314486E+02	+4.1273089E+00	+1.4010998E+02	+1.2988999E+02	+1.3345674E+02
251.0	10	+1.3098089E+02	+3.3284024E+00	+1.3636999E+02	+1.2644999E+02	+1.3395263E+02

STAGE 1,DISSECTED MOTOR=0012199,LOW RATE CHS=2.0 IN/MIN,MAXIMUM STRESS.

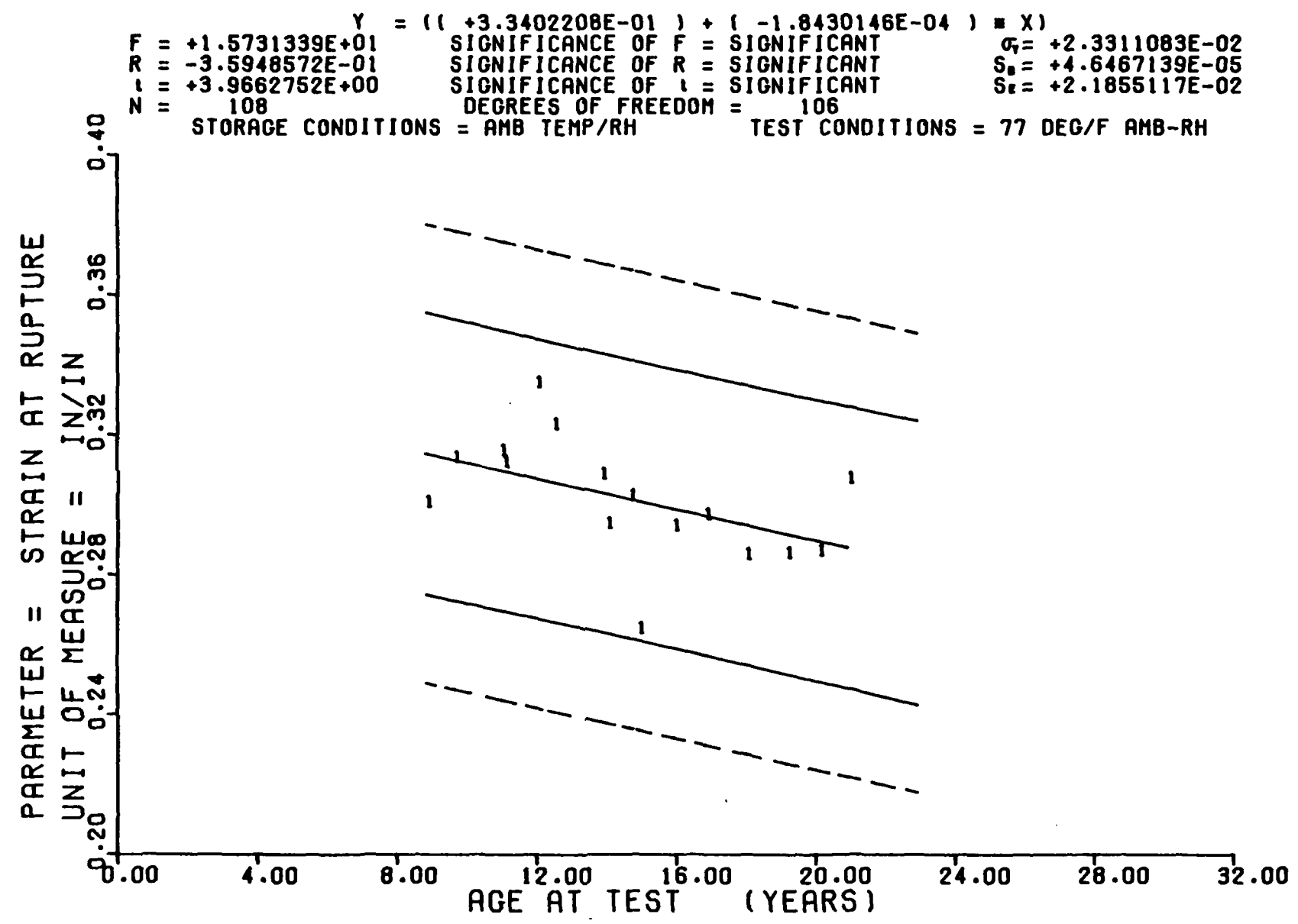
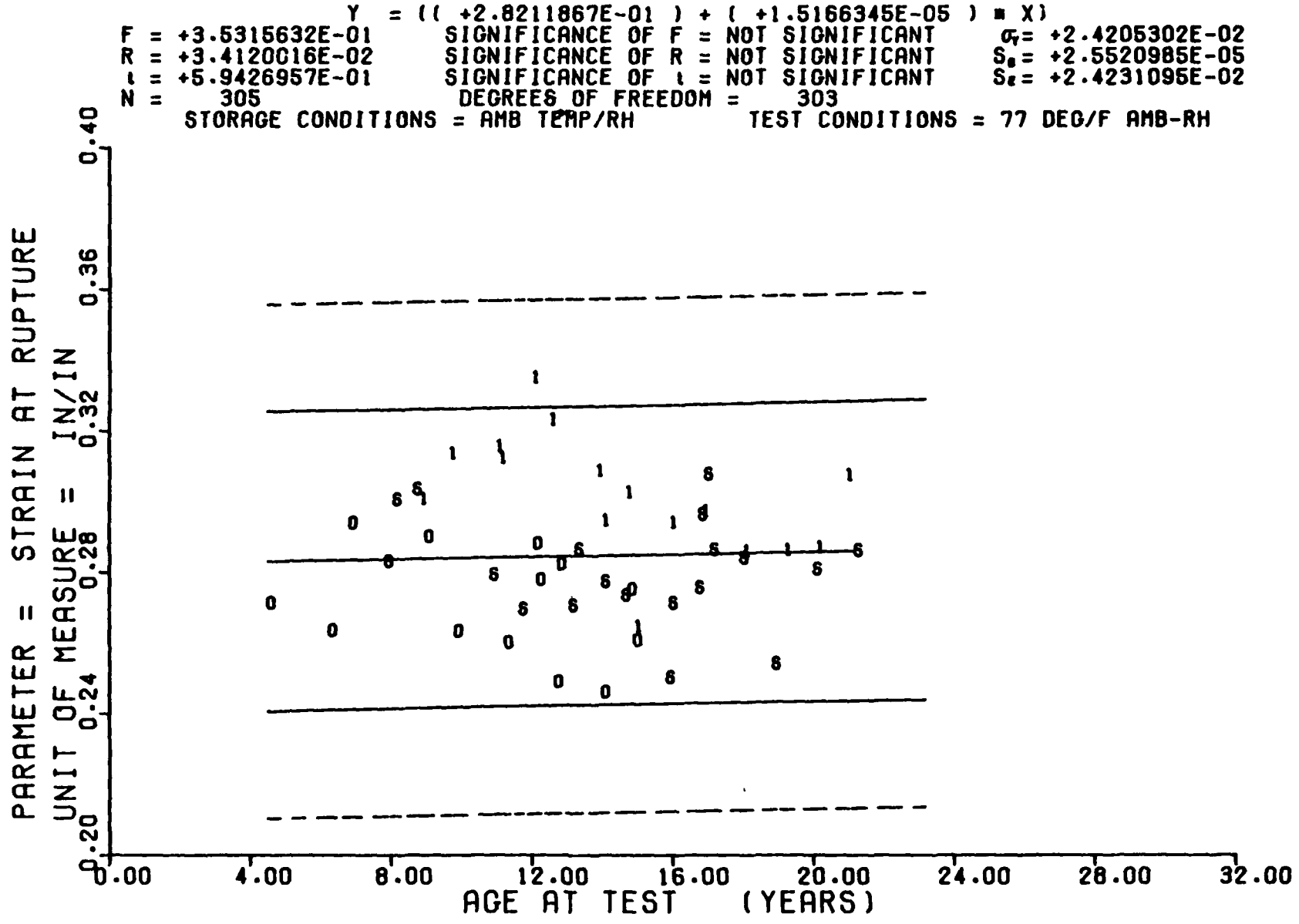

Y = ((+3.3402208E-01) + (-1.8430146E-04) ∗ X)
F = +1.5731339E+01 SIGNIFICANCE OF F = SIGNIFICANT σY= +2.3311083E-02
R = -3.5948572E-01 SIGNIFICANCE OF R = SIGNIFICANT SB = +4.6467139E-05
t = +3.9662752E+00 SIGNIFICANCE OF t = SIGNIFICANT SE = +2.1855117E-02
N = 108 DEGREES OF FREEDOM = 106
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = 77 DEG/F AMB-RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.40
0.36
0.32
0.28
0.24
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTOR=0012199.LOW RATE CHS=2.0 IN/MIN.STRAIN AT RUPTURE

Figure 3



STAGE 1 DISSECTED MOTORS,LOW RATE CHS=2.0 IN/MIN,STRAIN AT RUPTURE

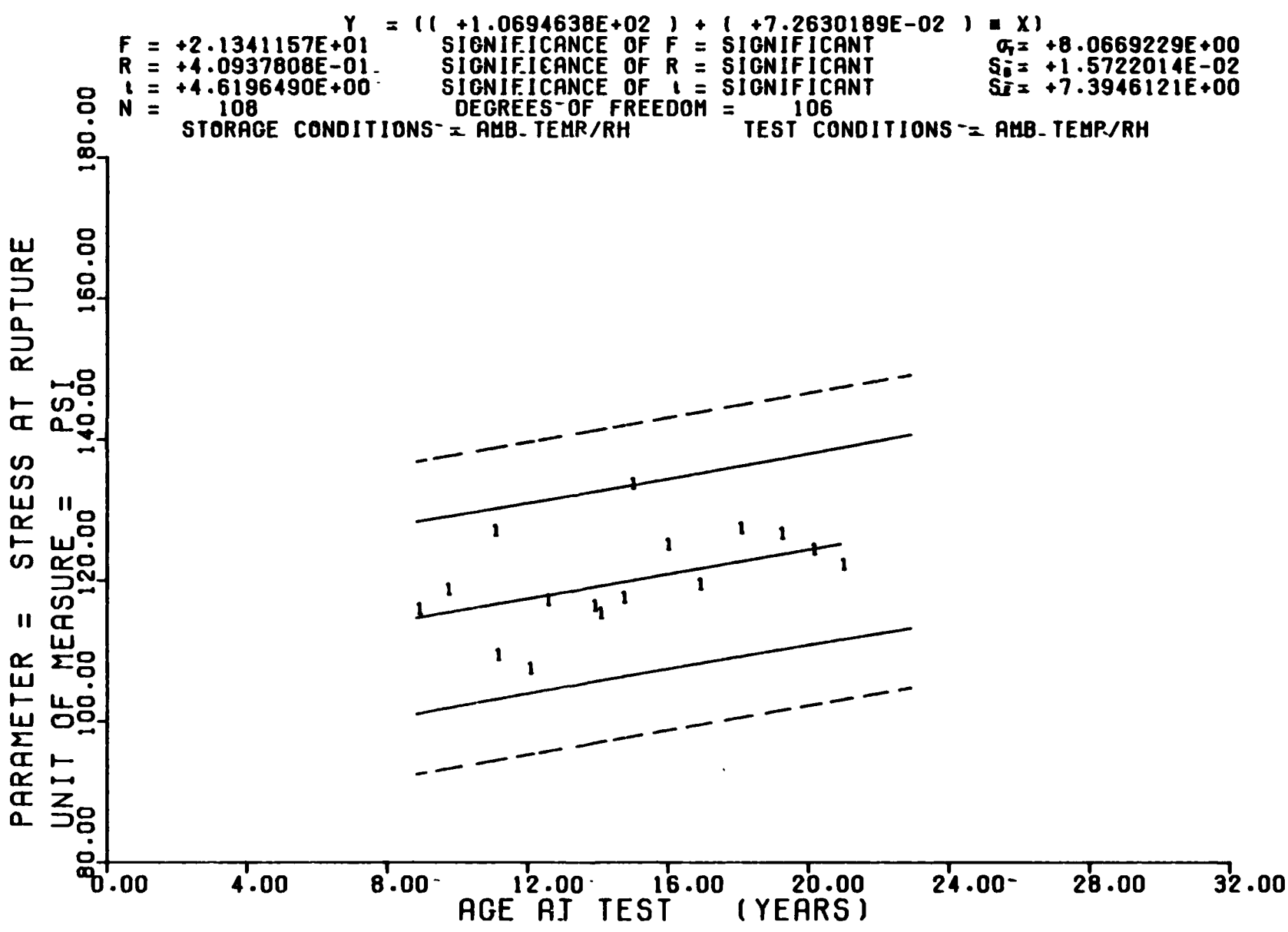
Figure 3A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

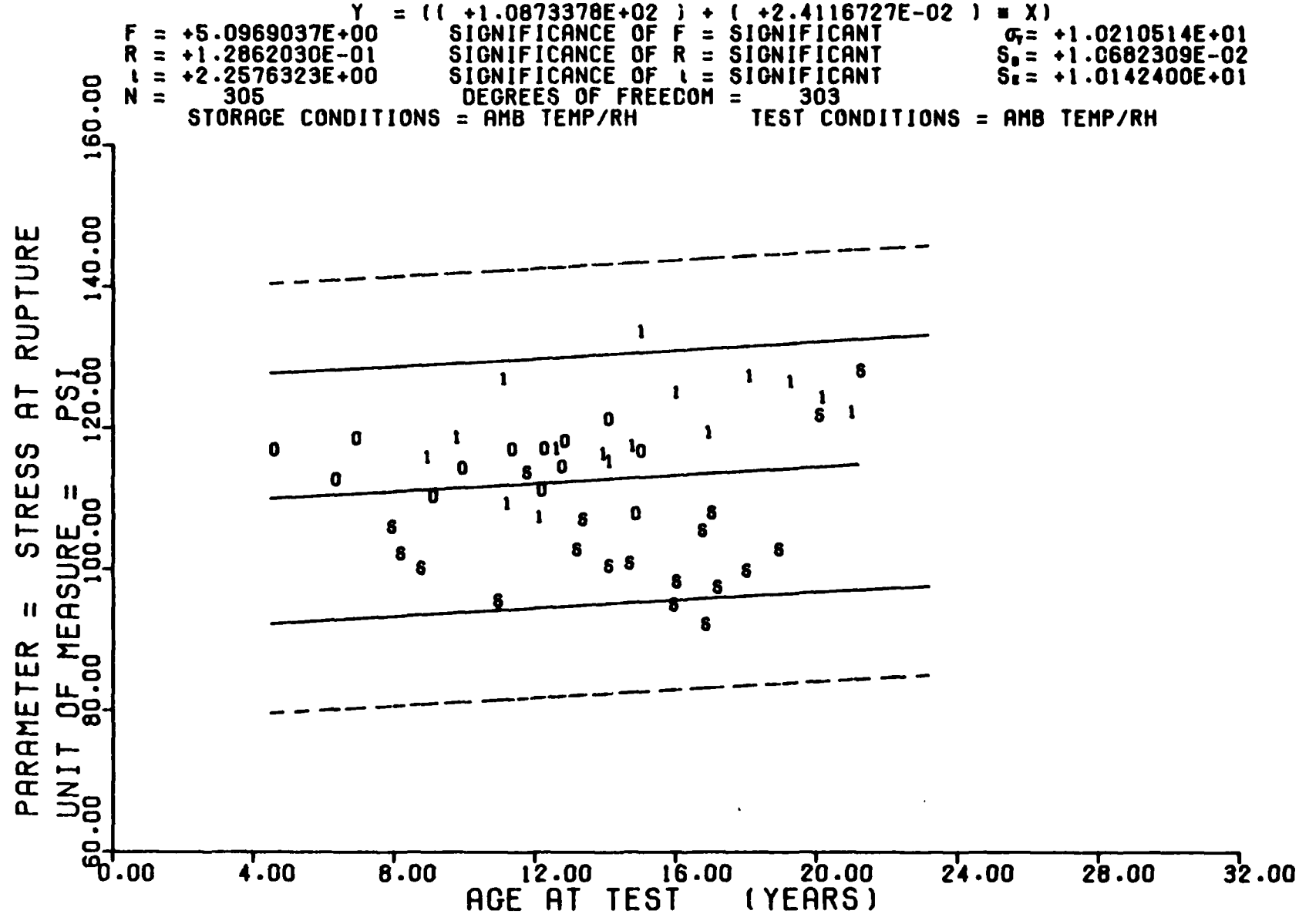
AGE (SECONDS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
108.0	5	+2.9939991E-01	+2.5593757E-02	+3.4299999E-01	+2.7799999E-01	+3.1448608E-01
110.0	5	+3.1219977E-01	+6.8069271E-03	+3.2199996E-01	+3.0399996E-01	+3.1264311E-01
132.0	9	+3.1418859E-01	+1.9246009E-02	+3.4899997E-01	+2.9919999E-01	+3.0969424E-01
133.0	10	+3.1037976E-01	+1.9156704E-02	+3.2649999E-01	+2.7099996E-01	+3.0950993E-01
144.0	5	+3.3369976E-01	+9.9597381E-03	+3.4749996E-01	+3.2119995E-01	+3.0748265E-01
150.0	8	+3.2132466E-01	+9.5749201E-03	+3.3299994E-01	+3.0759996E-01	+3.0637681E-01
167.0	5	+3.0745983E-01	+2.0130041E-02	+3.2719999E-01	+2.7859997E-01	+3.0342799E-01
168.0	3	+2.9333529E-01	+3.3381239E-02	+3.1599998E-01	+2.5499999E-01	+3.0305939E-01
170.0	3	+3.0126661E-01	+9.7516370E-03	+3.1009995E-01	+2.9079997E-01	+3.0156501E-01
179.0	5	+2.8337981E-01	+1.9173457E-02	+3.0329999E-01	+2.4259996E-01	+3.0103206E-01
191.0	8	+2.9273712E-01	+1.3820005E-02	+3.1169998E-01	+2.7379995E-01	+2.9882049E-01
202.0	8	+2.9599964E-01	+2.4650545E-02	+3.3799999E-01	+2.7199995E-01	+2.9679316E-01
216.0	8	+2.8457450E-01	+1.4511068E-02	+3.0379998E-01	+2.6209998E-01	+2.9421293E-01
250.0	8	+2.8494954E-01	+1.7983503E-02	+3.0199998E-01	+2.4399995E-01	+2.9163271E-01
261.0	8	+2.8566205E-01	+2.8660470E-02	+3.0899995E-01	+2.3599994E-01	+2.8960537E-01
291.0	10	+3.0617970E-01	+1.2067115E-02	+3.2269996E-01	+2.7999997E-01	+2.8776240E-01

STAGE 1 DISSECTED MOTOR=0012197,LOW RATE CHS=2.0 IN/MIN,STRAIN AT RUPTURE



STAGE 1.DISSECTED MOTOR=0012199.LOW RATE CHS=2.0 IN/MIN.STRESS AT RUPTURE.

Figure 4



STAGE 1 DISSECTED MOTORS.LOW RATE CHS=2.0 IN/MIN.STRESS AT RUPTURE

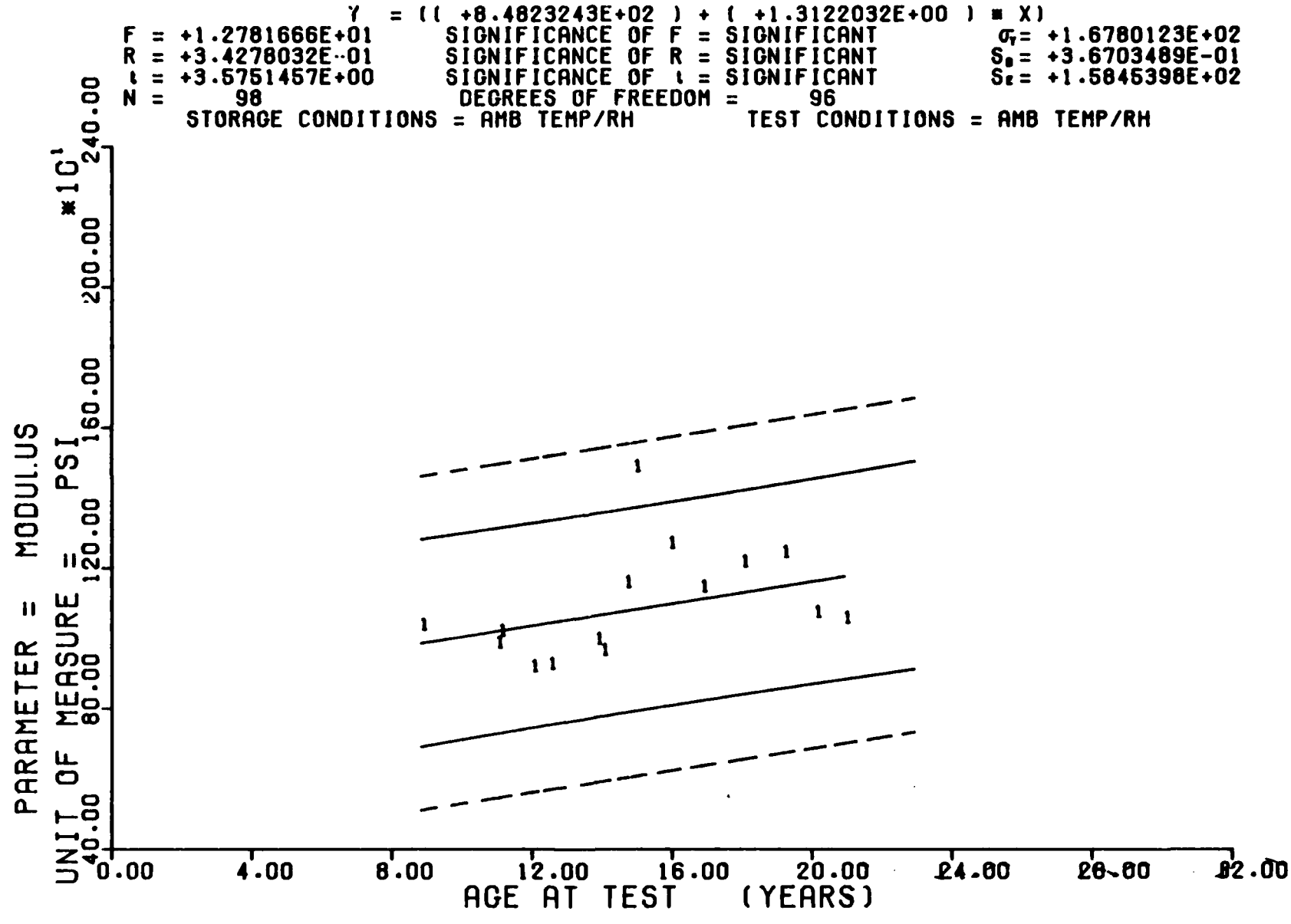
Figure 4A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

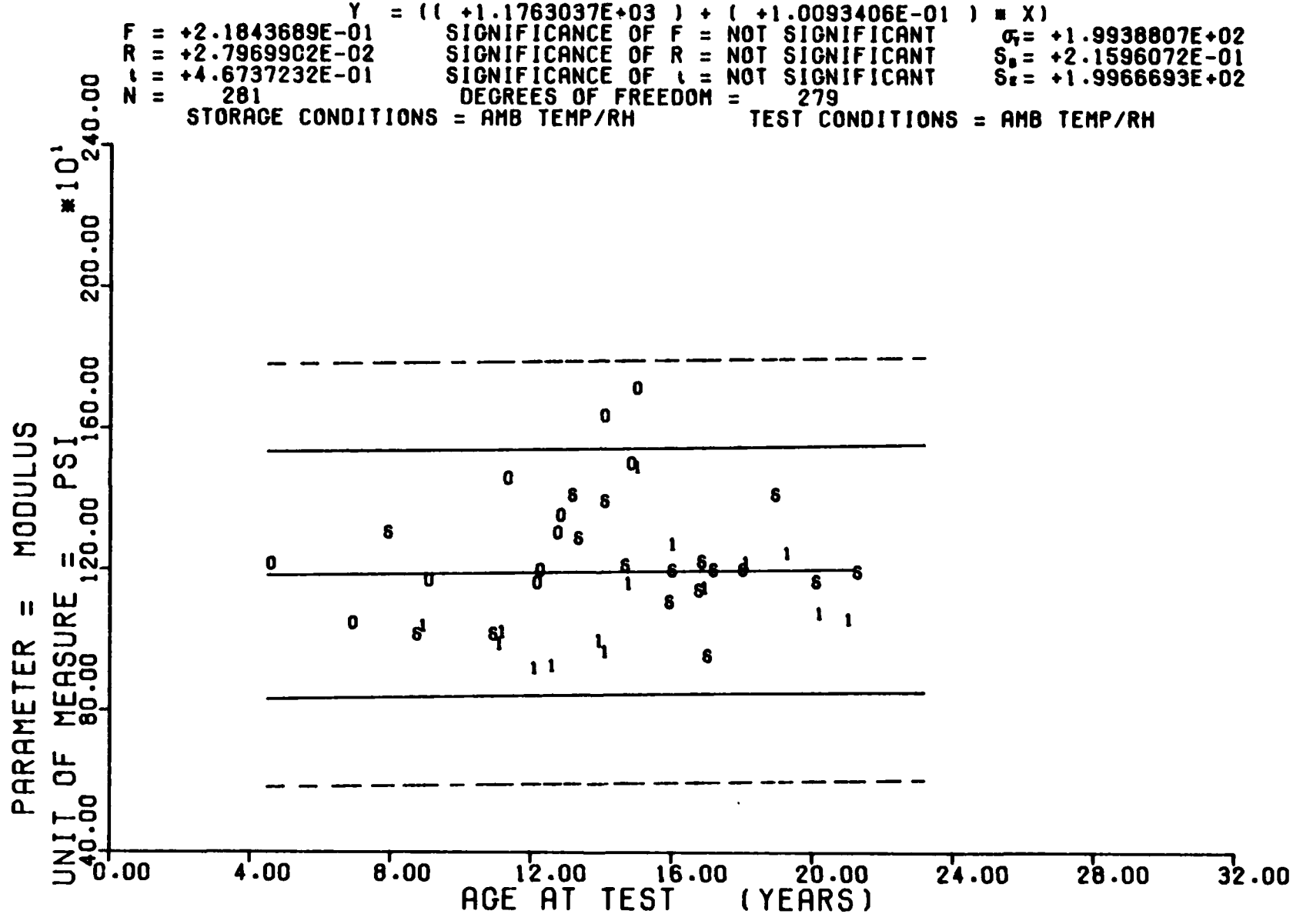
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+1.1519999E+02	+7.0851958E+00	+1.2100000E+02	+1.0300000E+02	+1.1464517E+02
116.0	5	+1.1800000E+02	+1.8708286E+00	+1.2100000E+02	+1.1600000E+02	+1.1537147E+02
132.0	9	+1.2632098E+02	+3.5167607E+00	+1.3064999E+02	+1.2004998E+02	+1.1653356E+02
133.0	10	+1.0868698E+02	+7.6735505E+00	+1.1900000E+02	+1.0111999E+02	+1.1660618E+02
144.0	5	+1.0674594E+02	+3.3354907E+00	+1.1002999E+02	+1.0140998E+02	+1.1740512E+02
150.0	8	+1.1645367E+02	+3.9645105E+00	+1.2200000E+02	+1.0929998E+02	+1.1784091E+02
156.0	5	+1.1564393E+02	+3.7064829E+00	+1.2129998E+02	+1.1175000E+02	+1.1900299E+02
168.0	3	+1.1458657E+02	+4.7396500E+00	+1.2000000E+02	+1.1119999E+02	+1.1914825E+02
176.0	3	+1.1682991E+02	+3.8598576E+00	+1.2014999E+02	+1.1259999E+02	+1.1972929E+02
179.0	5	+1.3299789E+02	+5.0633130E+00	+1.4128999E+02	+1.2678999E+02	+1.1994718E+02
191.0	8	+1.2436114E+02	+4.3855068E+00	+1.2893998E+02	+1.1760998E+02	+1.2081874E+02
202.0	8	+1.1872488E+02	+6.0911562E+00	+1.2929998E+02	+1.0959999E+02	+1.2161767E+02
216.0	8	+1.2669744E+02	+3.2387581E+00	+1.3122999E+02	+1.2100000E+02	+1.2263450E+02
230.0	8	+1.2593490E+02	+4.3085561E+00	+1.3529998E+02	+1.2159999E+02	+1.2365132E+02
241.0	8	+1.2368615E+02	+6.2735394E+00	+1.3389999E+02	+1.1819999E+02	+1.2445025E+02
251.0	10	+1.2154089E+02	+3.0718152E+00	+1.2777999E+02	+1.1832998E+02	+1.2517655E+02

STAGE 1,DISSECTED MOTOR=0012199,LOW RATE CHS=2.0 IN/MIN,STRESS AT RUPTURE.



STAGE 1.DISSECTED MOTOR=0012199.LOW RATE CHS=2.0 IN/MIN.MODULUS.

Figure 5



STAGE 1 DISSECTED MOTORS,LOW RATE CHS=2.0 IN/MIN,MODULUS

Figure 5A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (DAYS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
1[illegible].0	5	+1.0260000E+03	+1.0[illegible]571E+02	+1.1200000E+03	+8.5000000E+02	+9.8732592E+02
1[illegible].0	9	+9.7577758E+02	+1.2344713E+02	+1.1430000E+03	+8.0800000E+02	+1.0214431E+03
1[illegible].0	5	+1.0085993E+03	+1.1081456E+02	+1.1550000E+03	+8.7000000E+02	+1.0227553E+03
1[illegible].0	5	+9.0659985E+02	+5.1940350E+01	+9.8400000E+02	+8.5400000E+02	+1.0371896E+03
1[illegible].0	8	+9.1337500E+02	+7.7354356E+01	+1.1000000E+03	+8.5800000E+02	+1.0450627E+03
1[illegible].0	5	+9.8559985E+02	+4.4679973E+01	+1.0620000E+03	+9.4700000E+02	+1.0660581E+03
1[illegible].0	3	+9.5433325E+02	+1.7009831E+01	+9.7100000E+02	+9.3700000E+02	+1.0686824E+03
1[illegible].0	3	+1.1470000E+03	+1.3136477E+02	+1.3070000E+03	+1.0390000E+03	+1.0791801E+03
1[illegible].0	5	+1.0771999E+03	+4.3427429E+01	+1.0490000E+03	+1.0330000E+03	+1.0831166E+03
1[illegible].0	8	+1.0577500E+03	+3.7307775E+01	+1.0950000E+03	+1.0030000E+03	+1.0988630E+03
2[illegible].0	8	+1.1345000E+03	+1.6009193E+02	+1.3590000E+03	+9.3800000E+02	+1.1132973E+03
2[illegible].0	8	+1.2055000E+03	+5.2178265E+01	+1.2660000E+03	+1.1240000E+03	+1.1316682E+03
2[illegible].0	8	+1.2328750E+03	+6.0133226E+01	+1.3110000E+03	+1.1030000E+03	+1.1500490E+03
2[illegible].0	3	+1.0627500E+03	+1.3719199E+02	+1.3060000E+03	+9.5500000E+02	+1.1644733E+03
2[illegible].0	10	+1.0461999E+03	+7.4237509E+01	+1.1970000E+03	+9.4700000E+02	+1.1775952E+03

STAGE 1,DISSECTED MUTOR=0.012199,LOW RATE CHS=2.0 IN/MIN,MODULUS.

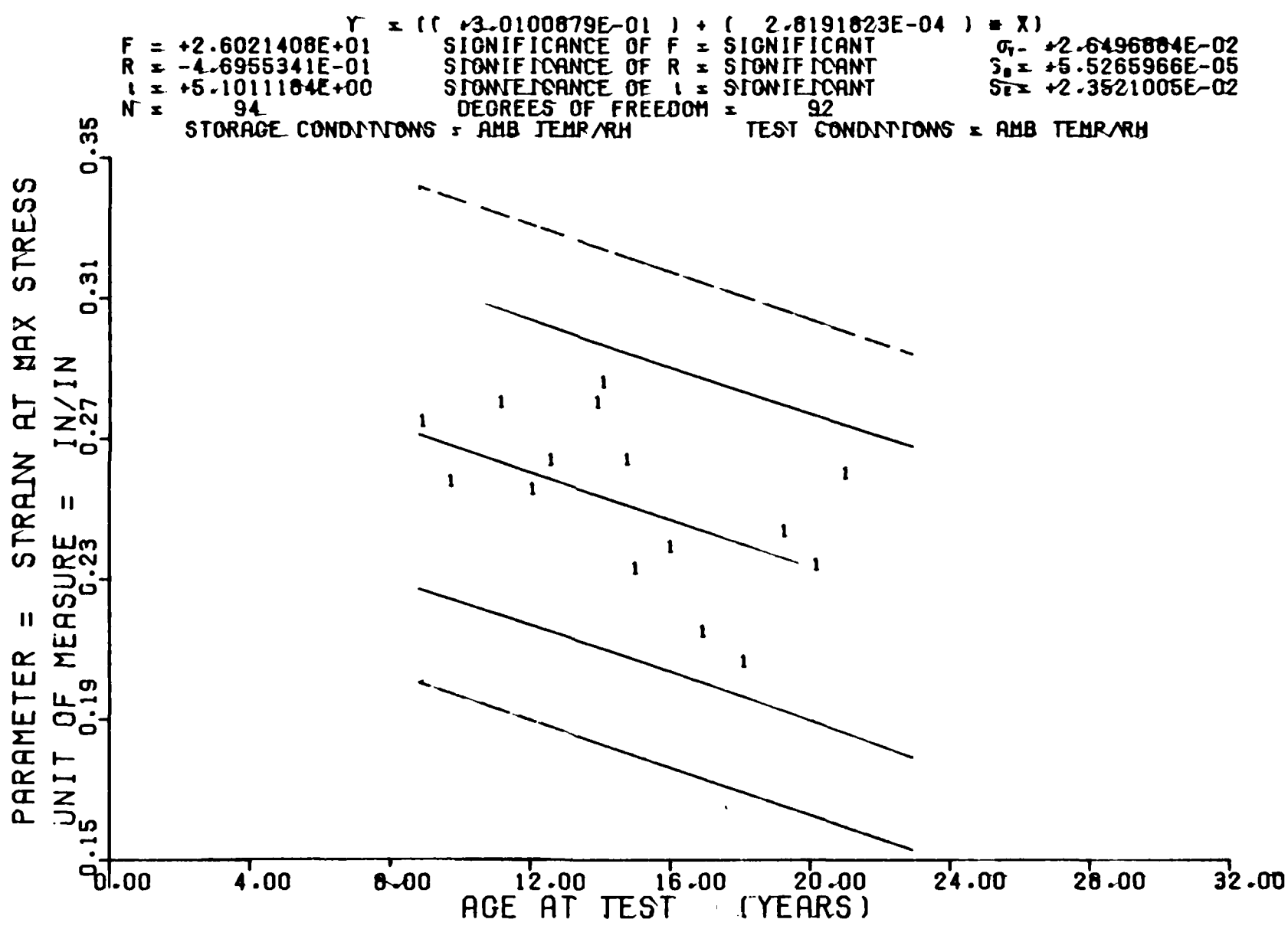
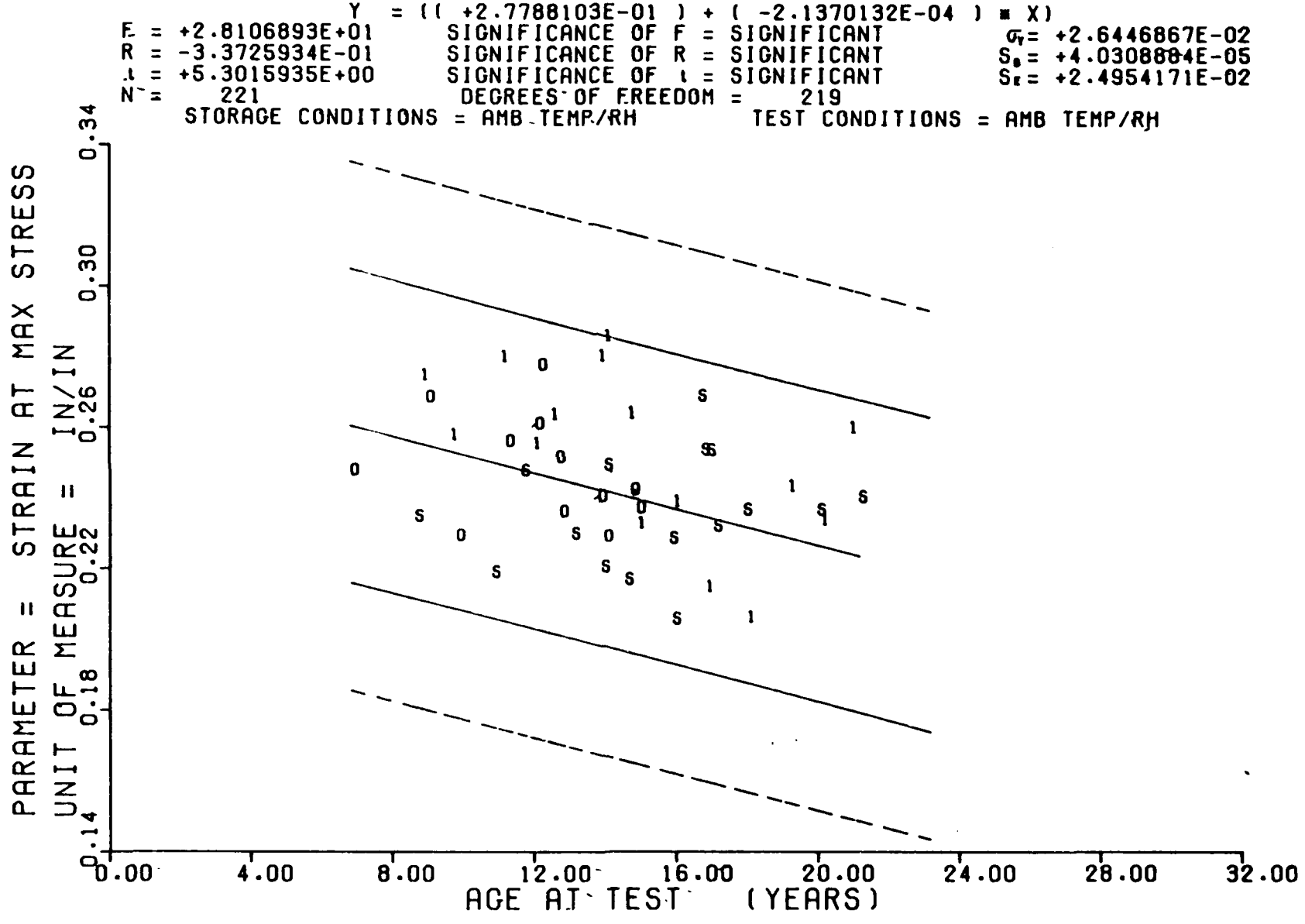

Y = ((+3.0100879E-01) + (2.8191823E-04) * X)
F = +2.6021408E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +2.6496884E-02
R = -4.6955341E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +5.5265966E-05
t = +5.1011184E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +2.3521005E-02
N = 94 DEGREES OF FREEDOM = 92
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.35
0.31
0.27
0.23
0.19
0.15
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTOR=0012199 LOT RATE CHS=20.0 MM/MM STRAIN MAX STRESS

Figure 6



STAGE 1 DISSECTED MOTORS,LOW RATE CHS=20.0 IN/MIN,STRAIN MAX STRESS

Figure 6A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+2.7359980E-01	+1.0485076E-02	+2.8399997E-01	+2.5999999E-01	+2.7112543E-01
116.0	5	+2.5659978E-01	+1.3431138E-02	+2.7999997E-01	+2.4899995E-01	+2.6830625E-01
133.0	9	+2.7891081E-01	+9.9499704E-03	+2.9299998E-01	+2.6429998E-01	+2.6351362E-01
144.0	4	+2.5424981E-01	+2.0436458E-02	+2.8099995E-01	+2.3199999E-01	+2.6041251E-01
150.0	9	+2.6248842E-01	+1.2791937E-02	+2.7699995E-01	+2.3709994E-01	+2.5872105E-01
166.0	5	+2.7895981E-01	+4.8522512E-03	+2.8429996E-01	+2.7229994E-01	+2.5421035E-01
168.0	3	+2.8466659E-01	+1.5947957E-02	+3.0299997E-01	+2.7399998E-01	+2.5364649E-01
176.0	3	+2.6269996E-01	+8.6006440E-03	+2.7239996E-01	+2.5599998E-01	+2.5139117E-01
179.0	5	+2.3163986E-01	+3.2074051E-03	+2.3469996E-01	+2.2699999E-01	+2.5054538E-01
191.0	8	+2.3784983E-01	+1.6565079E-02	+2.5329995E-01	+2.0669996E-01	+2.4716240E-01
202.0	8	+2.1374976E-01	+2.1607133E-02	+2.4399995E-01	+1.9299995E-01	+2.4406129E-01
216.0	8	+2.0511221E-01	+1.0029520E-02	+2.2129994E-01	+1.9449996E-01	+2.4011445E-01
230.0	9	+2.4225527E-01	+1.2546044E-02	+2.7299994E-01	+2.3229998E-01	+2.3616755E-01
241.0	3	+2.3269993E-01	+4.5106245E-03	+2.3789995E-01	+2.2979998E-01	+2.3306643E-01
251.0	10	+2.5678971E-01	+9.5627912E-03	+2.7209997E-01	+2.4009996E-01	+2.3024725E-01

STAGE 1 DISSECTED MOTOR=0012199,LOW RATE CHS=20.0 IN/MIN,STRAIN MAX STRESS

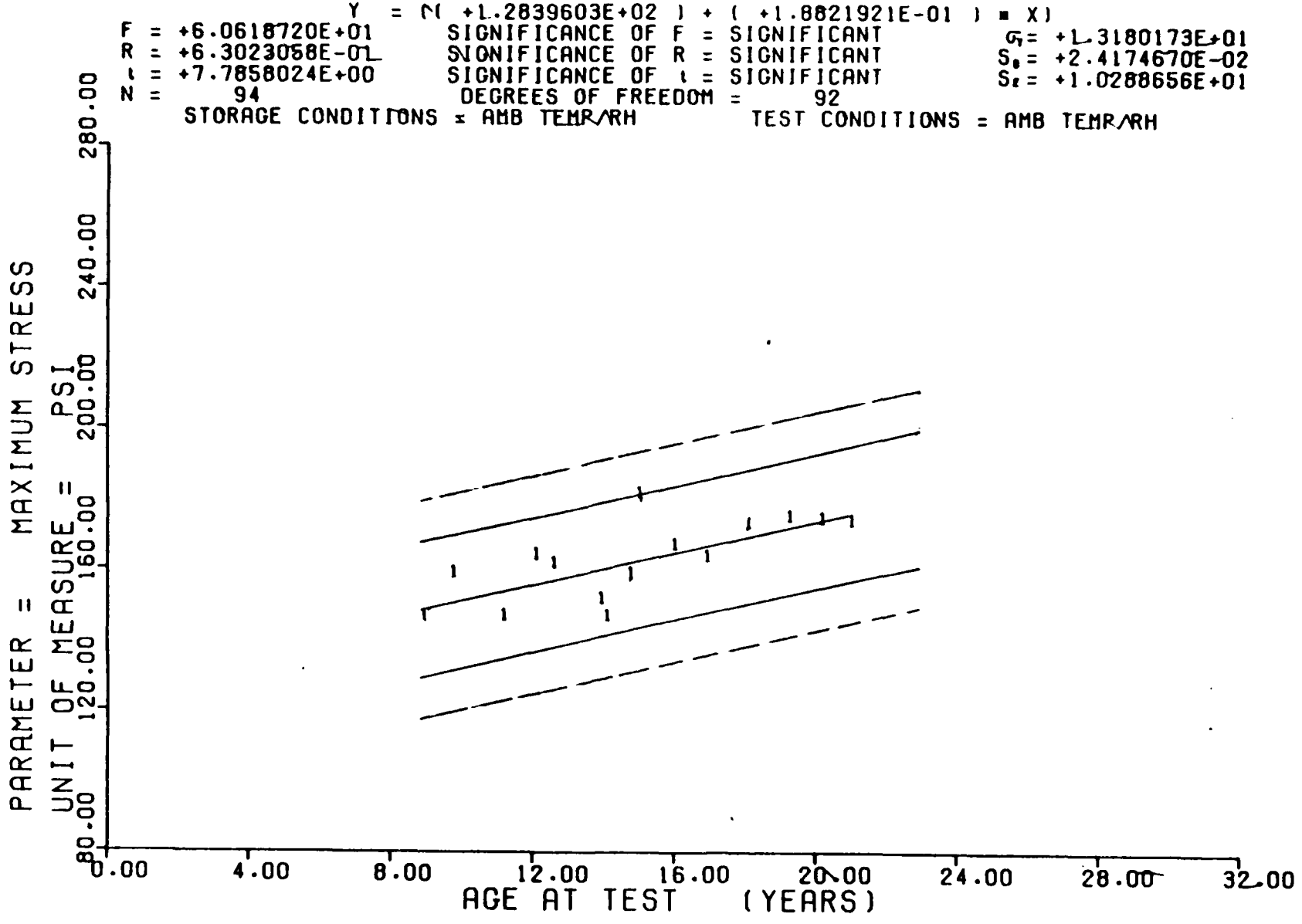
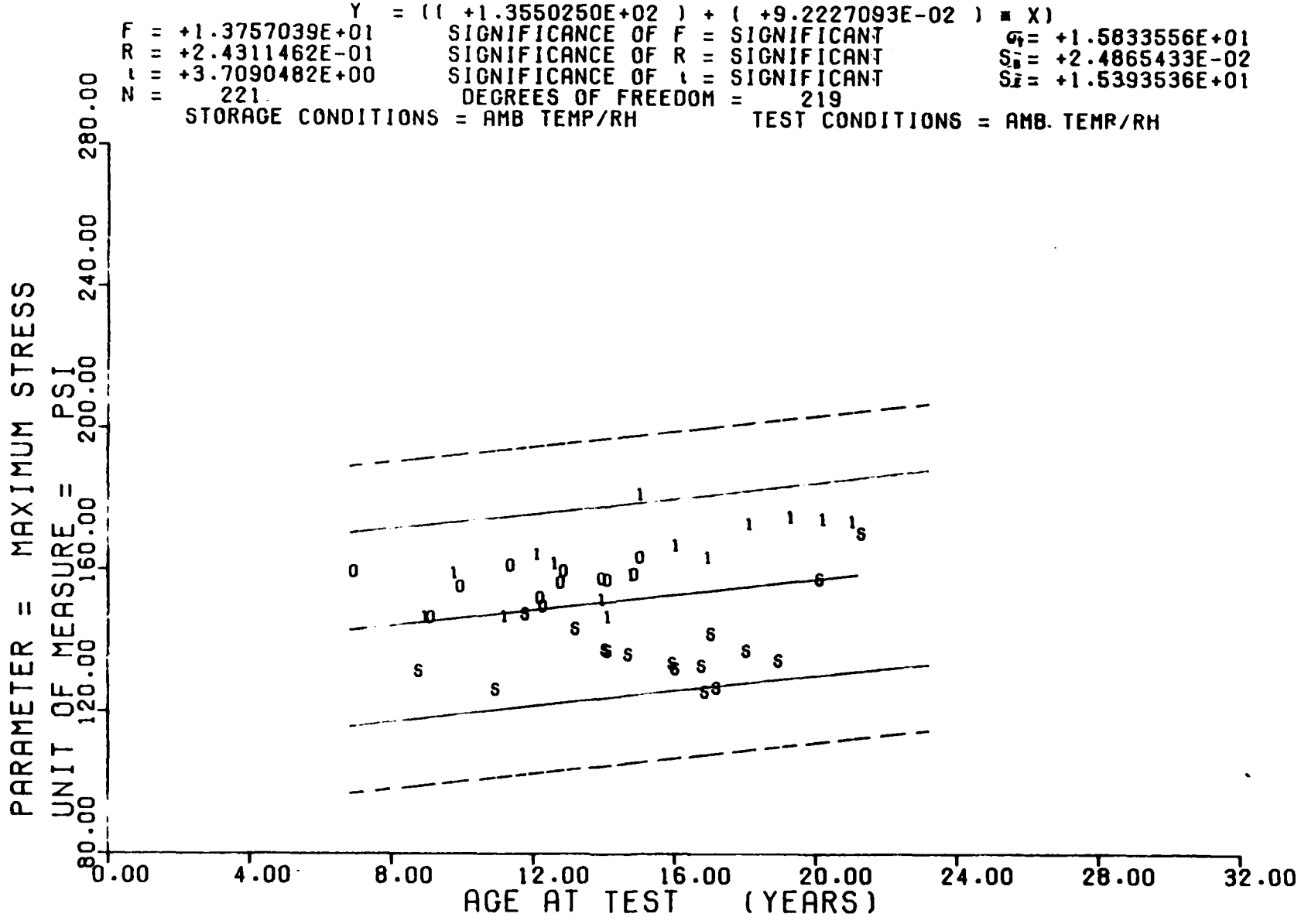

Y = (+1.2839603E+02) + (+1.8821921E-01) * X)
F = +6.0618720E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +1.3180173E+01
R = +6.3023058E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +2.4174670E-02
t = +7.7858024E+00 SIGNIFICANCE OF t = SIGNIFICANT Sε = +1.0288656E+01
N = 94 DEGREES OF FREEDOM = 92
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
80.00
120.00
160.00
200.00
240.00
280.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISSECTED MOTOR=0012199.LOW RATE CHS=20.0 IN/MIN.MAX STRESS.

Figure 7



STAGE 1 DISSECTED-MOTORS,LOW RATE CHS=20.0 IN/MIN,MAXIMUM STRESS

Figure 7A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+1.4539999E+02	+1.1401754E+00	+1.4700000E+02	+1.4400000E+02	+1.4834725E+02
116.0	5	+1.5779998E+02	+5.8906705E+00	+1.6300000E+02	+1.5000000E+02	+1.5022946E+02
133.0	9	+1.4562550E+02	+1.8129338E+01	+1.6710998E+02	+1.2800000E+02	+1.5342918E+02
144.0	4	+1.6316491E+02	+9.0004990E+00	+1.7140998E+02	+1.5039999E+02	+1.5549958E+02
150.0	9	+1.6055654E+02	+5.7467006E+00	+1.6950000E+02	+1.5562998E+02	+1.5662890E+02
166.0	5	+1.5049194E+02	+2.7810708E+00	+1.5372999E+02	+1.4684999E+02	+1.5964041E+02
168.0	3	+1.4558992E+02	+1.5274839E+00	+1.4714999E+02	+1.4411999E+02	+1.6001686E+02
176.0	3	+1.5740322E+02	+2.7589509E+00	+1.6057998E+02	+1.5564999E+02	+1.6152261E+02
179.0	5	+1.8026391E+02	+2.9412120E+00	+1.8273999E+02	+1.7536999E+02	+1.6208726E+02
191.0	8	+1.6575241E+02	+7.5057718E+00	+1.7664999E+02	+1.5643998E+02	+1.6434590E+02
202.0	8	+1.6239987E+02	+1.1881877E+01	+1.7589999E+02	+1.4789999E+02	+1.6641630E+02
216.0	8	+1.7199243E+02	+4.6476210E+00	+1.7795999E+02	+1.6335998E+02	+1.6905137E+02
230.0	9	+1.7388323E+02	+5.1922320E+00	+1.8154998E+02	+1.6819999E+02	+1.7168644E+02
241.0	3	+1.7332656E+02	+5.9083106E+00	+1.7707998E+02	+1.6651998E+02	+1.7375685E+02
251.0	10	+1.7268588E+02	+4.8429620E+00	+1.7704998E+02	+1.6259999E+02	+1.7563905E+02

STAGE 1,DISSECTED MOTOR=0012199,LOW RATE CHS=20.0 IN/MIN,MAX STRESS.

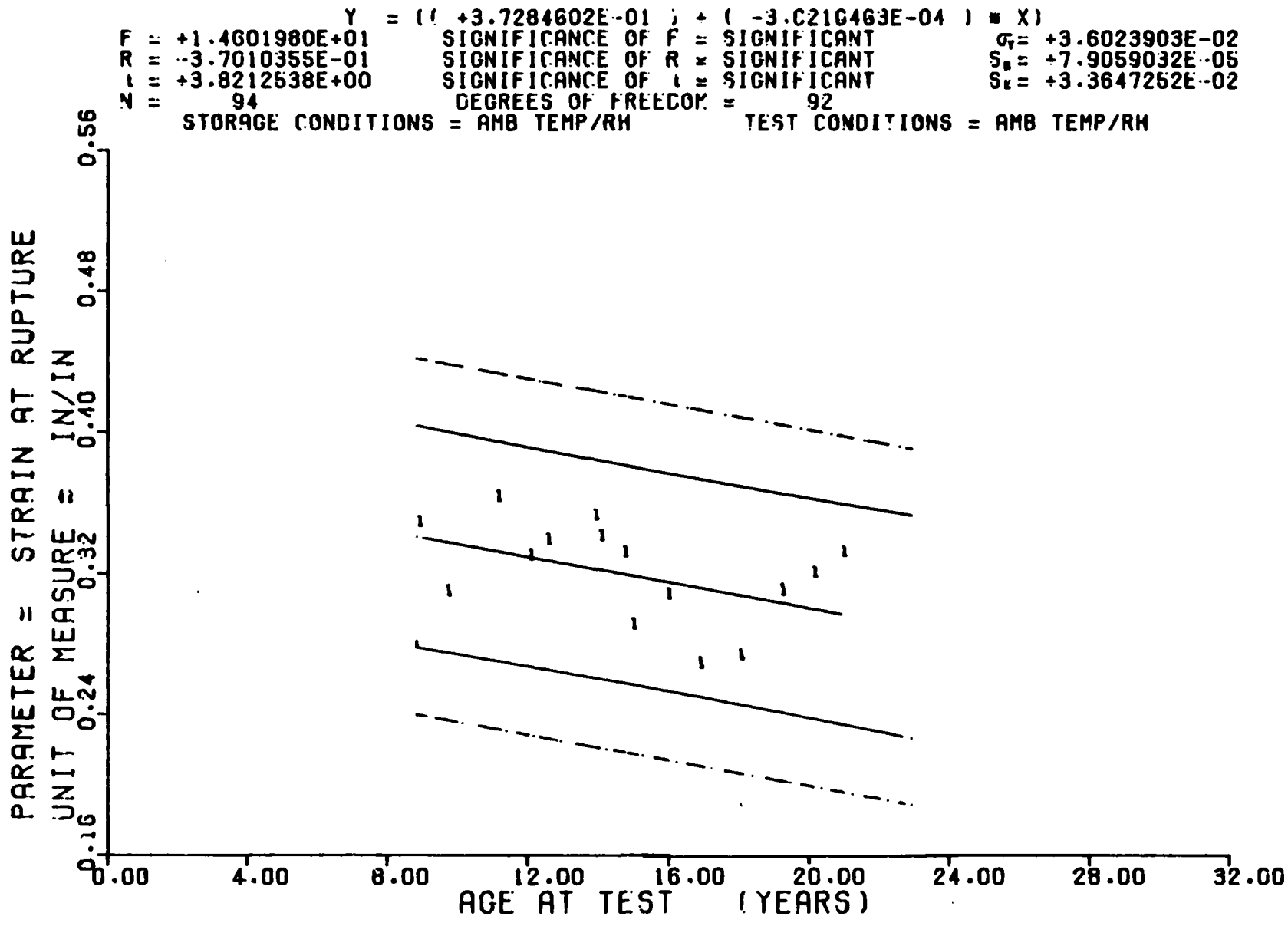
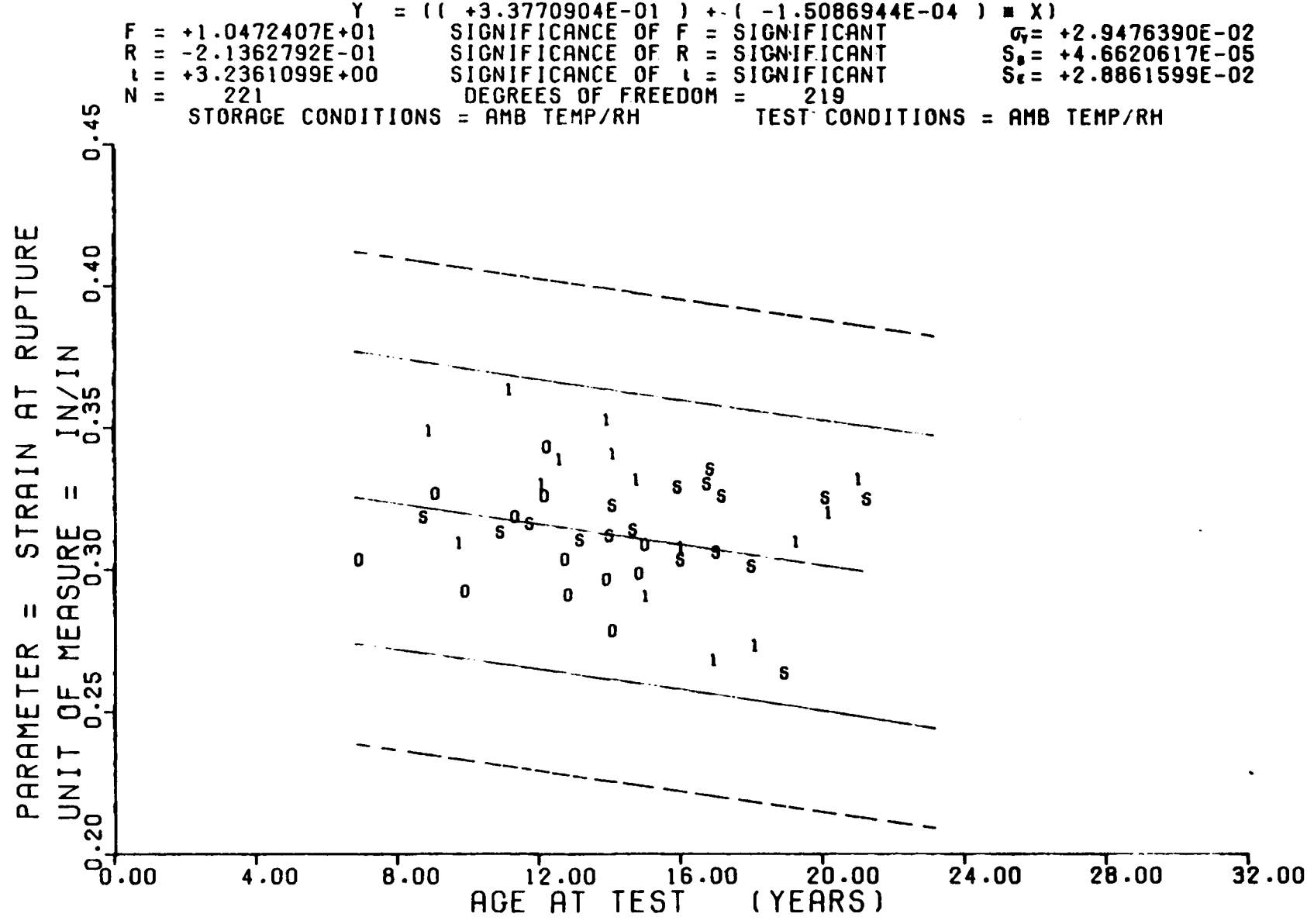

Y = (+3.7284602E-01) + (-3.C21G463E-04) * X)
F = +1.4601980E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -3.7010355E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +3.8212538E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 94 DEGREES OF FREEDOM = 92
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.16
0.24
0.32
0.40
0.48
0.56
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTOR=0012199,LOW RATE CMS=20.0 IN/MIN,STRAIN AT RUPTURE

Figure 8



STAGE 1 DISSECTED MOTORS.LOW RATE CHS=20.0 IN/MIN.STRAIN AT RUPTURE

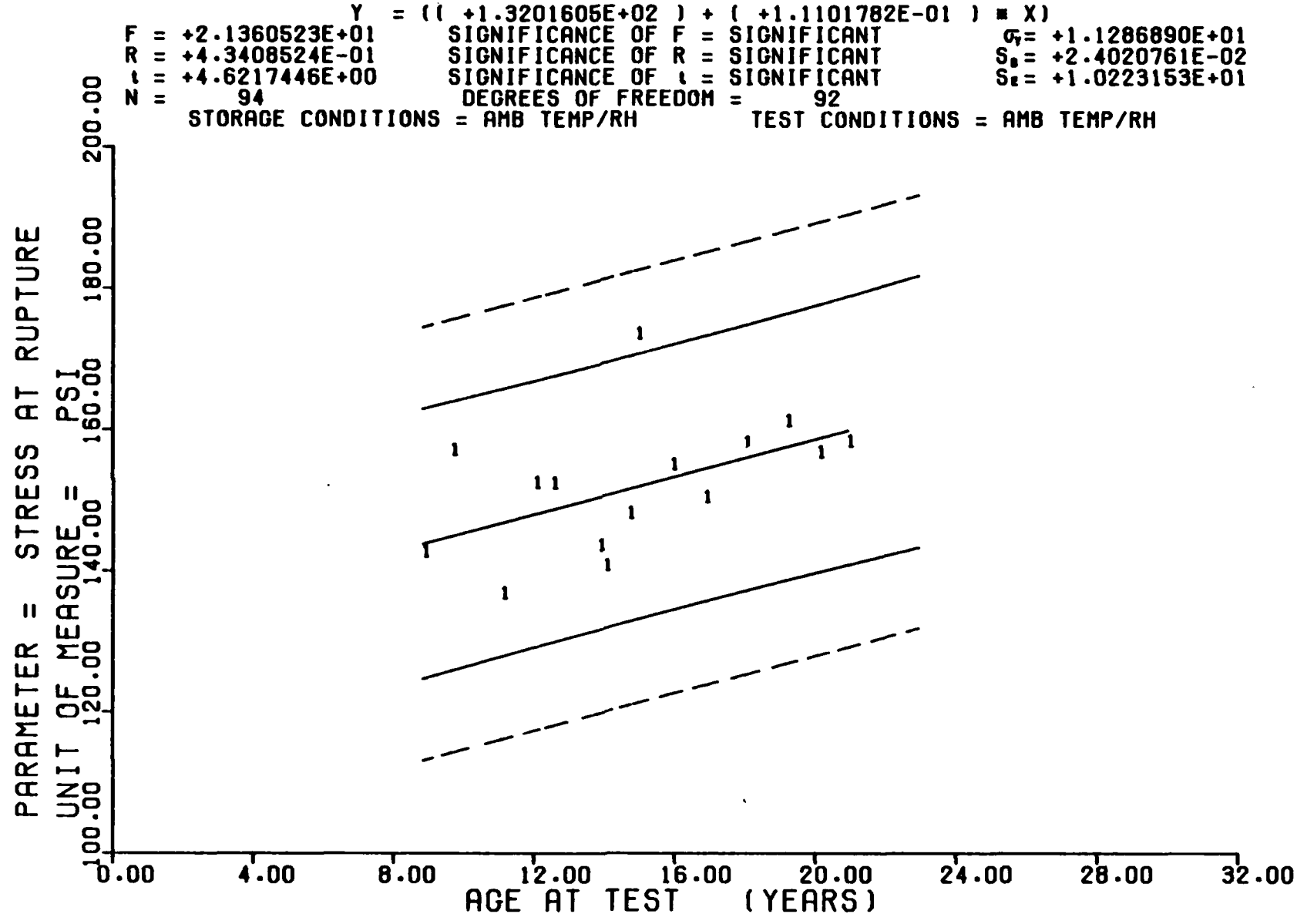
Figure 8A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+3.4719961E-01	+2.0295265E-02	+3.6799997E-01	+3.1599998E-01	+3.4082287E-01
116.0	5	+3.0759978E-01	+1.7688302E-02	+3.3299994E-01	+2.8299999E-01	+3.3780187E-01
133.0	9	+3.6161059E-01	+1.6582326E-02	+3.9699995E-01	+3.4099996E-01	+3.3266609E-01
144.0	4	+3.2827472E-01	+3.4613049E-02	+3.7199997E-01	+2.9869997E-01	+3.2934290E-01
150.0	9	+3.3699965E-01	+1.9222032E-02	+3.6099994E-01	+2.9899996E-01	+3.2753032E-01
166.0	5	+3.5083961E-01	+3.6958573E-03	+3.5659998E-01	+3.4729999E-01	+3.2269662E-01
168.0	3	+3.3899974E-01	+1.7326479E-02	+3.5899996E-01	+3.2899999E-01	+3.2209241E-01
176.0	3	+3.2986658E-01	+4.3023919E-03	+3.3239996E-01	+3.2489997E-01	+3.1967556E-01
179.0	5	+2.8893983E-01	+9.4803047E-03	+2.9809999E-01	+2.7589994E-01	+3.1876927E-01
191.0	8	+3.0583715E-01	+4.0401991E-02	+3.4329998E-01	+2.1779996E-01	+3.1514400E-01
202.0	8	+2.6649975E-01	+2.8762047E-02	+3.0299997E-01	+2.2799998E-01	+3.1182086E-01
216.0	8	+2.7162480E-01	+1.1146937E-02	+2.8999996E-01	+2.5399994E-01	+3.0759137E-01
230.0	9	+3.0813300E-01	+3.2158108E-02	+3.5099995E-01	+2.5019997E-01	+3.0336195E-01
241.0	5	+3.1833326E-01	+1.5501815E-02	+3.3599996E-01	+3.0699998E-01	+3.0003875E-01
251.0	10	+3.3018970E-01	+1.5808676E-02	+3.4629994E-01	+2.9139995E-01	+2.9701775E-01

STAGE 1 DISSECTED MOTOR=0012199,LOW RATE CHS=20.0 IN/MIN,STRAIN AT RUPTURE



STAGE 1.DISSECTED MOTOR=0012199.LOW RATE CHS=20.0 IN/MIN.STRESS AT RUPTURE.

Figure 9

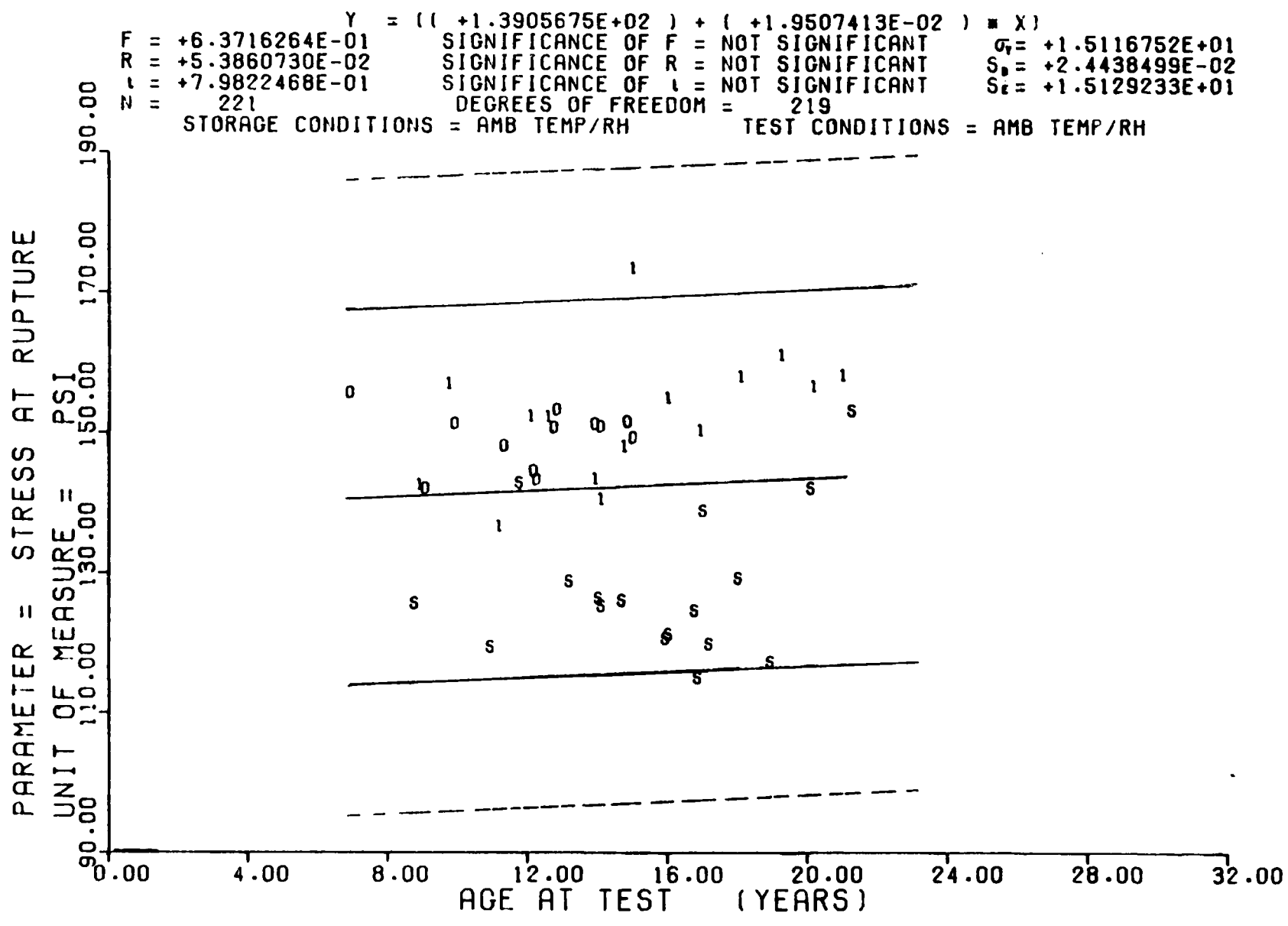

Y = ((+1.3905675E+02) + (+1.9507413E-02) * X)
F = +6.3716264E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σT = +1.5116752E+01
R = +5.3860730E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +2.4438499E-02
t = +7.9822468E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +1.5129233E+01
N = 221 DEGREES OF FREEDOM = 219
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
190.00
170.00
150.00
130.00
110.00
90.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTORS,LOW RATE CHS=20.0 IN/MIN,STRESS AT RUPTURE

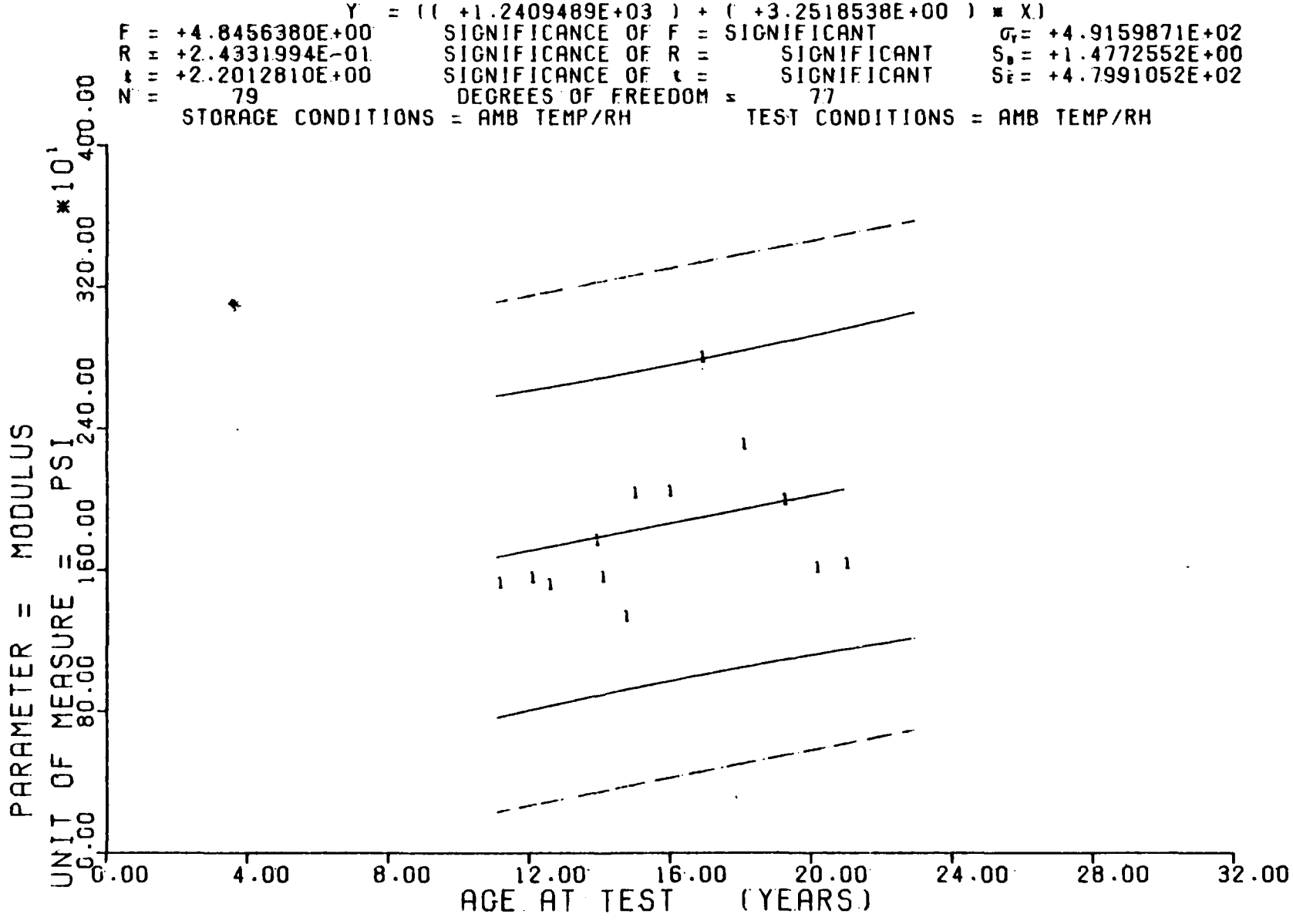
Figure 9A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

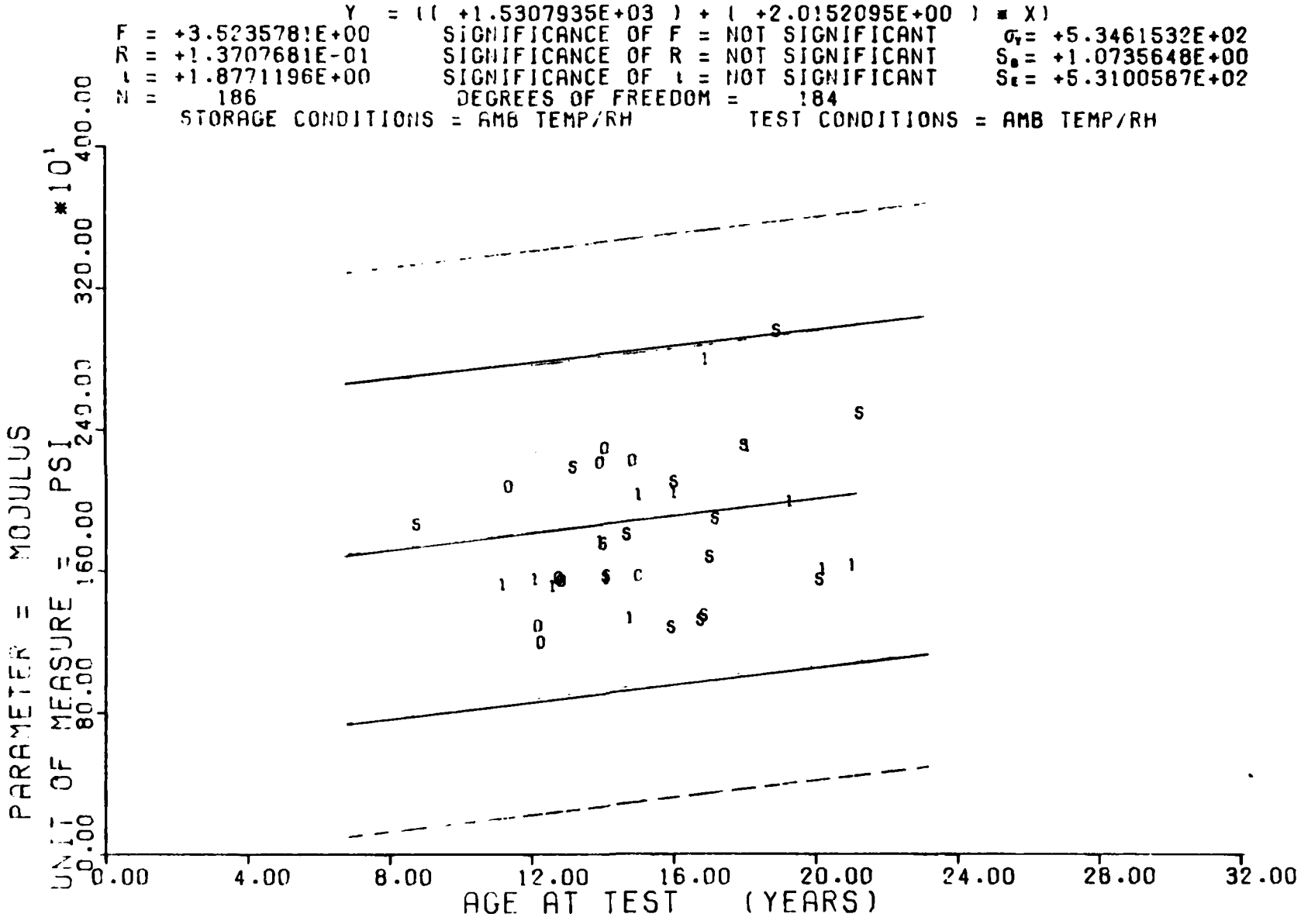
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+1.4200000E+02	+7.0710678E-01	+1.4300000E+02	+1.4100000E+02	+1.4378393E+02
116.0	5	+1.5639999E+02	+6.5421708E+00	+1.6100000E+02	+1.4700000E+02	+1.4489411E+02
133.0	9	+1.3611994E+02	+1.2542600E+01	+1.5085998E+02	+1.2100000E+02	+1.4678141E+02
144.0	4	+1.5178485E+02	+9.7755807E+00	+1.6177999E+02	+1.4029998E+02	+1.4800260E+02
150.0	9	+1.5171101E+02	+5.4151206E+00	+1.6000000E+02	+1.4564999E+02	+1.4866871E+02
166.0	5	+1.4296391E+02	+3.9280589E+00	+1.4617999E+02	+1.3654998E+02	+1.5044500E+02
168.0	3	+1.4005989E+02	+1.6887985E+00	+1.4123999E+02	+1.3813999E+02	+1.5066703E+02
176.0	3	+1.4750325E+02	+3.4042401E+00	+1.5141999E+02	+1.4531999E+02	+1.5155517E+02
179.0	5	+1.7289788E+02	+3.9573571E+00	+1.7591999E+02	+1.6612998E+02	+1.5188822E+02
191.0	8	+1.5439489E+02	+9.3510893E+00	+1.6657998E+02	+1.4237998E+02	+1.5322044E+02
202.0	8	+1.4976239E+02	+1.1379018E+01	+1.6369999E+02	+1.3329998E+02	+1.5444165E+02
216.0	8	+1.5747738E+02	+5.3541638E+00	+1.6284999E+02	+1.4659999E+02	+1.5599589E+02
230.0	9	+1.6055543E+02	+7.2916759E+00	+1.7279998E+02	+1.4919999E+02	+1.5755014E+02
241.0	3	+1.5614656E+02	+6.8852199E+00	+1.6013999E+02	+1.4819999E+02	+1.5877134E+02
251.0	10	+1.5769886E+02	+4.7399551E+00	+1.6689999E+02	+1.5116999E+02	+1.5988151E+02

STAGE 1,DISSECTED MOTOR=0012199,LOW RATE CHS=20.0 IN/MIN.STRESS AT RUPTURE.



STAGE 1,DISSECTED MOTOR=0012199,LOW RATE CHS=20.0 IN/MIN,MODULUS.

Figure 10



STAGE 1 DISSECTED MOTORS,LOW RATE CHS=20.0 IN/MIN,MODULUS

Figure 10A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

[illegible] (SECONDS)	OBSERVATIONS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
1[illegible].0	4	+1.3007500E+03	+1.5479314E+02	+1.5320000E+03	+1.2900000E+03	+1.6734453E+03
1[illegible].0	4	+1.3257500E+03	+5.7640839E+01	+1.3420000E+03	+1.4430000E+03	+1.7092158E+03
1[illegible].0	9	+1.4915554E+03	+1.9134331E+02	+1.7020000E+03	+1.0530000E+03	+1.7287270E+03
1[illegible].0	5	+1.7443999E+03	+5.7112170E+01	+1.8230000E+03	+1.6820000E+03	+1.7807565E+03
1[illegible].0	5	+1.5530000E+03	+4.1302905E+02	+1.9650000E+03	+1.1420000E+03	+1.7872602E+03
17[illegible].0	3	+1.3110000E+03	+1.9774984E+01	+1.3230000E+03	+1.2890000E+03	+1.8132751E+03
17[illegible].0	5	+2.3092999E+03	+1.9632001E+02	+2.2370000E+03	+1.7270000E+03	+1.8230307E+03
1[illegible]1.0	8	+2.0193750E+03	+4.1418092E+02	+2.5480000E+03	+1.4550000E+03	+1.8620529E+03
[illegible]0	8	+2.7761250E+03	+5.1386266E+02	+3.1950000E+03	+2.0400000E+03	+1.8973232E+03
[illegible]0.0	8	+2.2838750E+03	+4.4223107E+02	+2.7560000E+03	+1.2810000E+03	+1.9433493E+03
[illegible].0	9	+1.9705554E+03	+1.4557009E+02	+2.1386000E+03	+1.7050000E+03	+1.9888752E+03
[illegible]1.0	3	+1.5896000E+03	+1.4432710E+02	+1.6720000E+03	+1.4210000E+03	+2.0246457E+03
[illegible]1.0	10	+1.6100000E+03	+2.2374511E+02	+2.1060000E+03	+1.3910000E+03	+2.0571640E+03

STAGE 1,1 SELECTED MOTOR=0012199,LOW RATE CMS=20.0 IN/MIN,MODULUS.

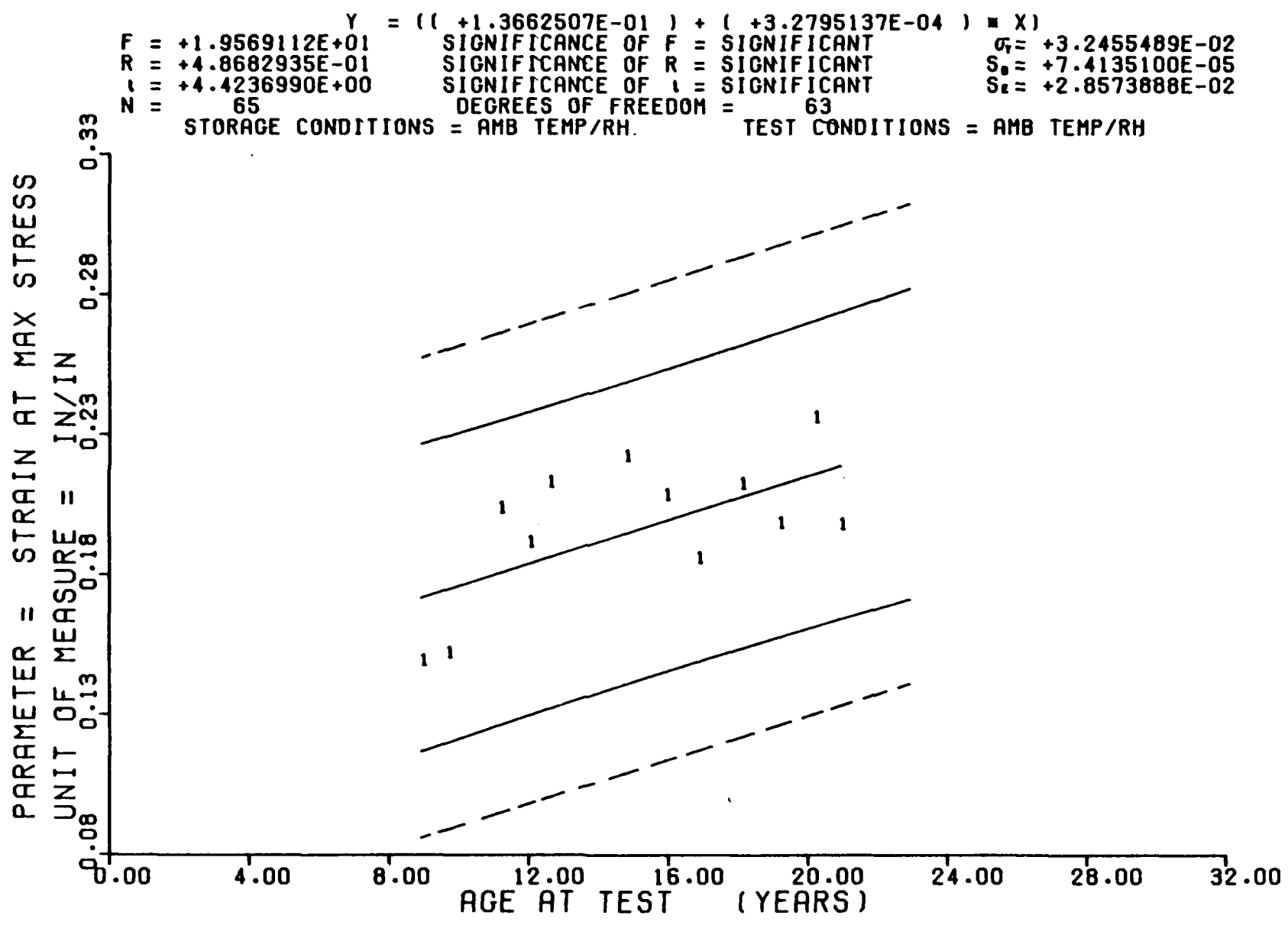
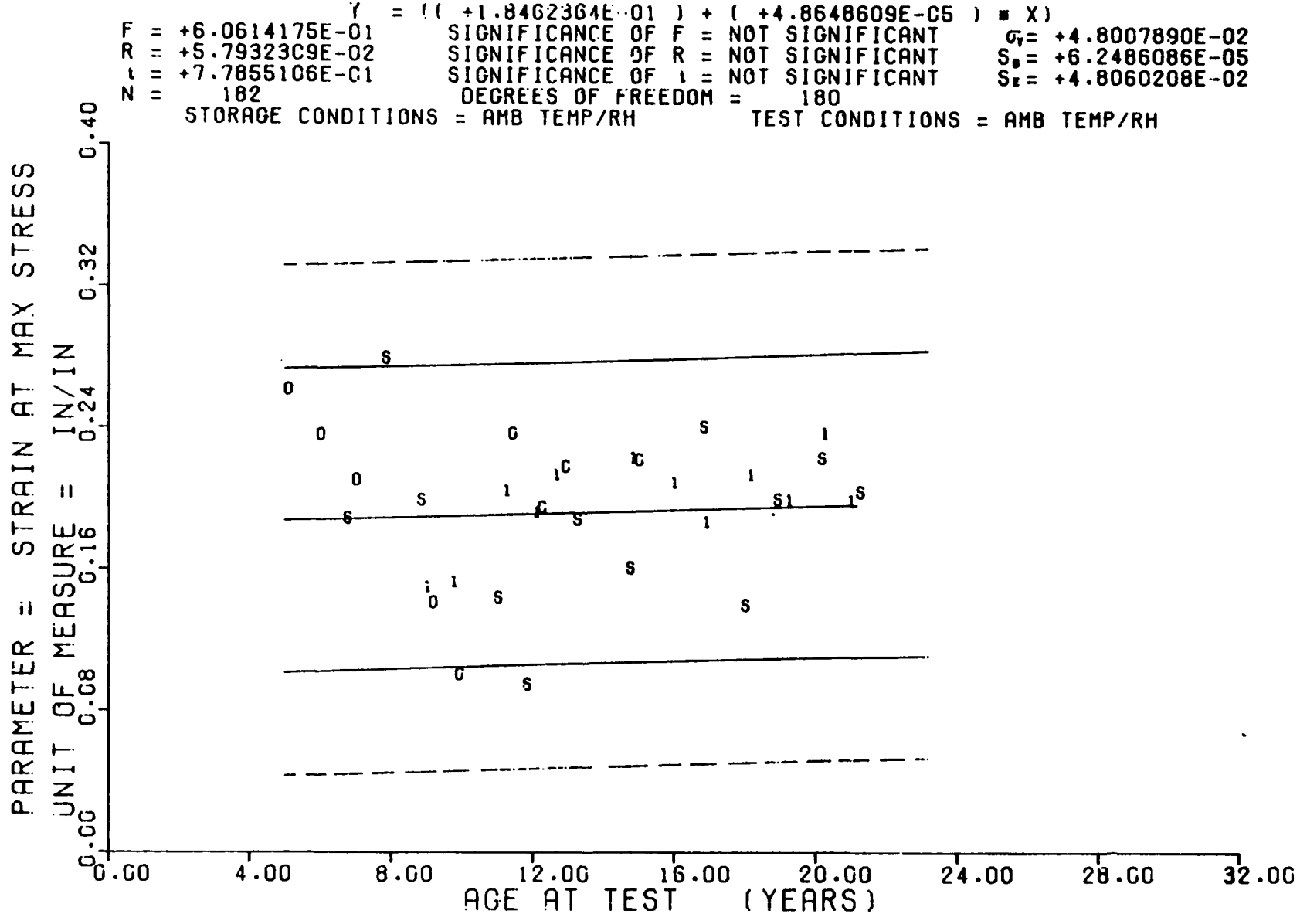

Y = ((+1.3662507E-01) + (+3.2795137E-04) * X)
F = +1.9569112E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +4.8682935E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +4.4236990E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 65 DEGREES OF FREEDOM = 63
STORAGE CONDITIONS = AMB TEMP/RH. TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.08
0.13
0.18
0.23
0.28
0.33
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,STRAIN MAX STRESS.

Figure 11



STAGE 1 DISSECTED MOTORS.HIGH RATE CHS=1750 IN/MIN.STRAIN MAX STRESS

Figure 11A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	5	+1.4759993E-01	+1.3145107E-02	+1.6199994E-01	+1.3399994E-01	+1.7171585E-01
116.0	6	+1.5049993E-01	+3.3351092E-02	+1.9599997E-01	+1.0499995E-01	+1.7466741E-01
134.0	5	+2.0217990E-01	+4.0187017E-02	+2.2319996E-01	+1.3059997E-01	+1.8057054E-01
144.0	5	+1.8997997E-01	+2.0181864E-02	+2.1459996E-01	+1.6019999E-01	+1.8385004E-01
151.0	5	+2.1135973E-01	+1.0450773E-02	+2.2559994E-01	+1.9729995E-01	+1.8614572E-01
177.0	6	+2.2083312E-01	+9.7075748E-03	+2.3799997E-01	+2.0999997E-01	+1.9467246E-01
191.0	5	+2.0693987E-01	+3.6089004E-02	+2.4839997E-01	+1.5759998E-01	+1.9926375E-01
202.0	6	+1.8431663E-01	+1.7907310E-02	+2.0139998E-01	+1.5649998E-01	+2.0287120E-01
217.0	5	+2.1091991E-01	+8.6918641E-03	+2.2169995E-01	+2.0389997E-01	+2.0779049E-01
230.0	5	+1.9689995E-01	+6.8038571E-03	+2.0349997E-01	+1.8799996E-01	+2.1205383E-01
242.0	6	+2.3463308E-01	+2.7743720E-02	+2.6579999E-01	+1.9159996E-01	+2.1598929E-01
251.0	6	+1.9644987E-01	+5.3150602E-03	+2.0199996E-01	+1.8899995E-01	+2.1894085E-01

STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,STRAIN MAX STRESS.

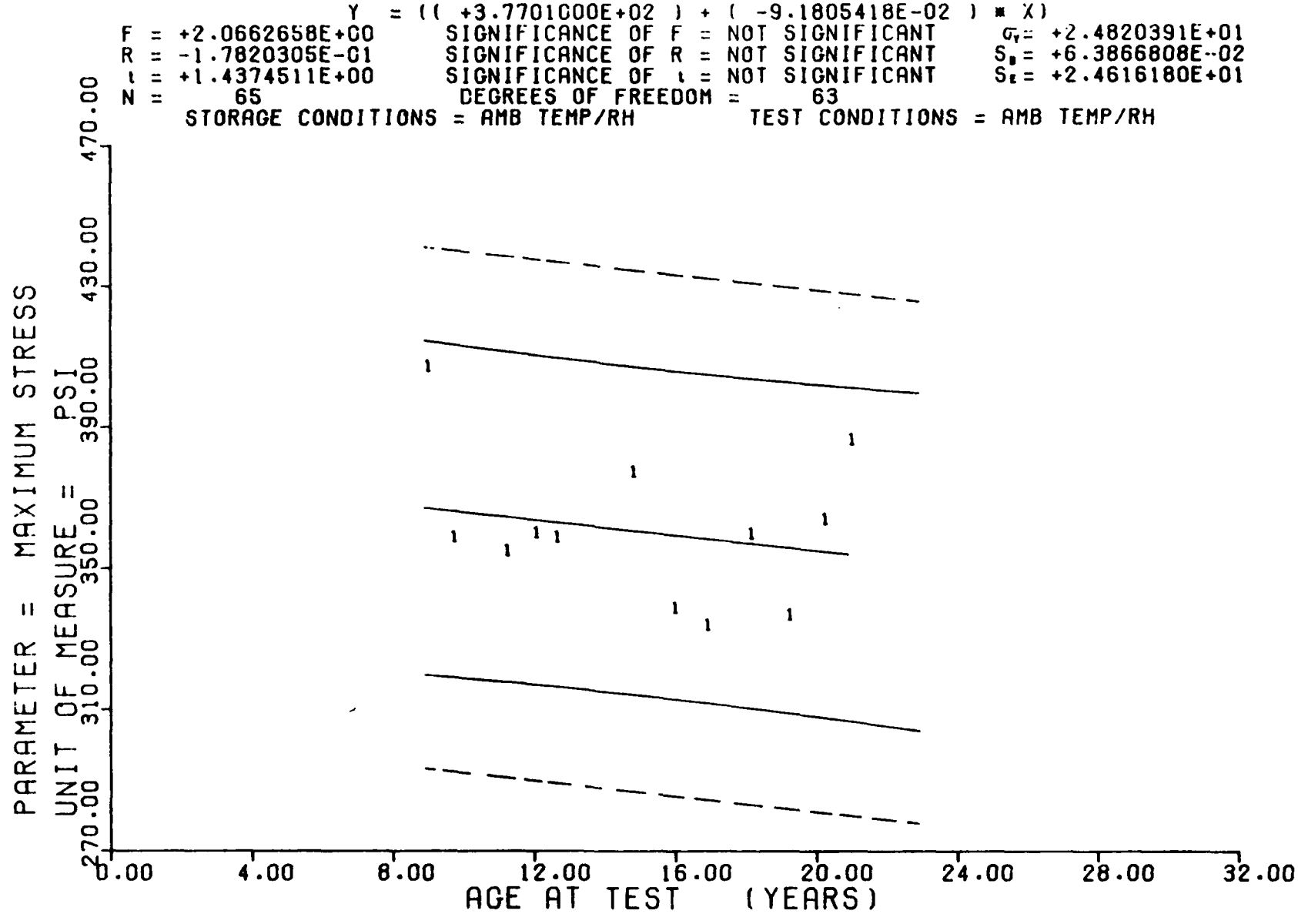
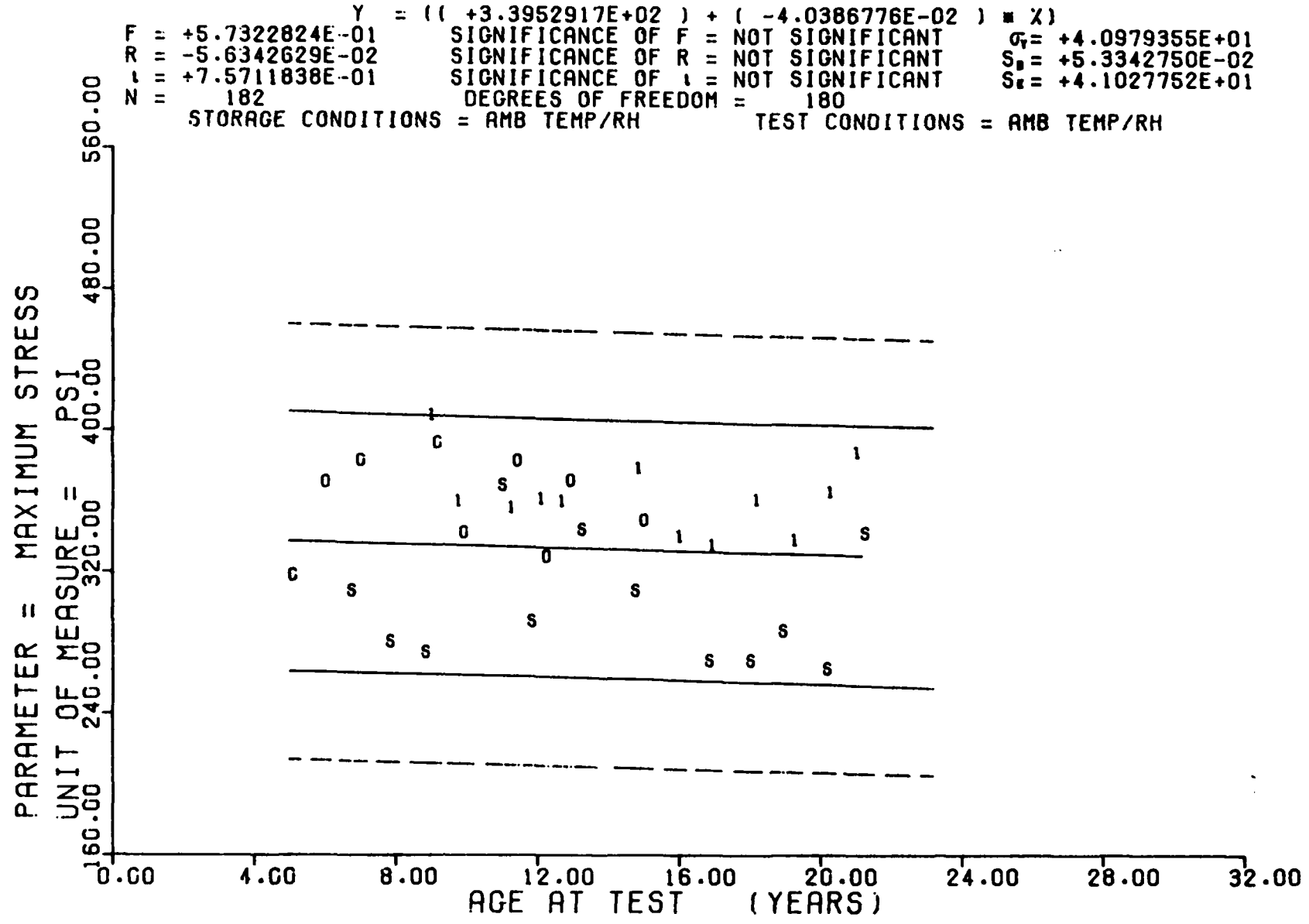

Y = ((+3.7701000E+02) + (-9.1805418E-02) * X)
F = +2.0662658E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +2.4820391E+01
R = -1.7820305E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +6.3866808E-02
t = +1.4374511E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +2.4616180E+01
N = 65 DEGREES OF FREEDOM = 63
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
470.00
430.00
390.00
350.00
310.00
270.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
*AGE 1.DISSECTED MOTOR=0012199.HIGH RATE CHS=1750 IN/MIN.MAXIMUM STRESS.

Figure 12



STAGE 1 DISSECTED MOTORS.HIGH RATE CHS=1750 IN/MIN.MAXIMUM STRESS

Figure 12A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (GROUPED)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	5	+4.0600000E+02	+3.2158383E+00	+4.2000000E+02	+4.0000000E+02	+3.6718676E+02
116.0	6	+3.9750000E+02	+6.1237243E+00	+3.7000000E+02	+3.5500000E+02	+3.6636035E+02
124.0	5	+3.5370776E+02	+1.1019634E+01	+3.6982583E+02	+3.4551977E+02	+3.6470800E+02
144.0	5	+3.5878588E+02	+1.8505524E+01	+3.8692993E+02	+3.3694995E+02	+3.6378979E+02
151.0	5	+3.5750390E+02	+6.9630851E+00	+3.7012988E+02	+3.4733984E+02	+3.6314721E+02
177.0	6	+3.7609814E+02	+1.9800236E+01	+4.0364990E+02	+3.5144995E+02	+3.6076025E+02
191.0	5	+3.3750781E+02	+3.2679392E+00	+3.4128979E+02	+3.3345996E+02	+3.5947509E+02
202.0	6	+3.3206479E+02	+3.4120061E+01	+3.6627978E+02	+2.9976977E+02	+3.5846508E+02
217.0	5	+3.5852368E+02	+2.1591322E+00	+3.6157983E+02	+3.5661987E+02	+3.5708813E+02
230.0	5	+3.3550195E+02	+4.3301720E+00	+3.4126977E+02	+3.2923999E+02	+3.5589453E+02
242.0	6	+3.6271972E+02	+1.7689354E+01	+3.9661987E+02	+3.5057983E+02	+3.5479296E+02
251.0	6	+3.8516137E+02	+1.4333740E+01	+4.0954960E+02	+3.7025976E+02	+3.5396679E+02

STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,MAXIMUM STRESS.

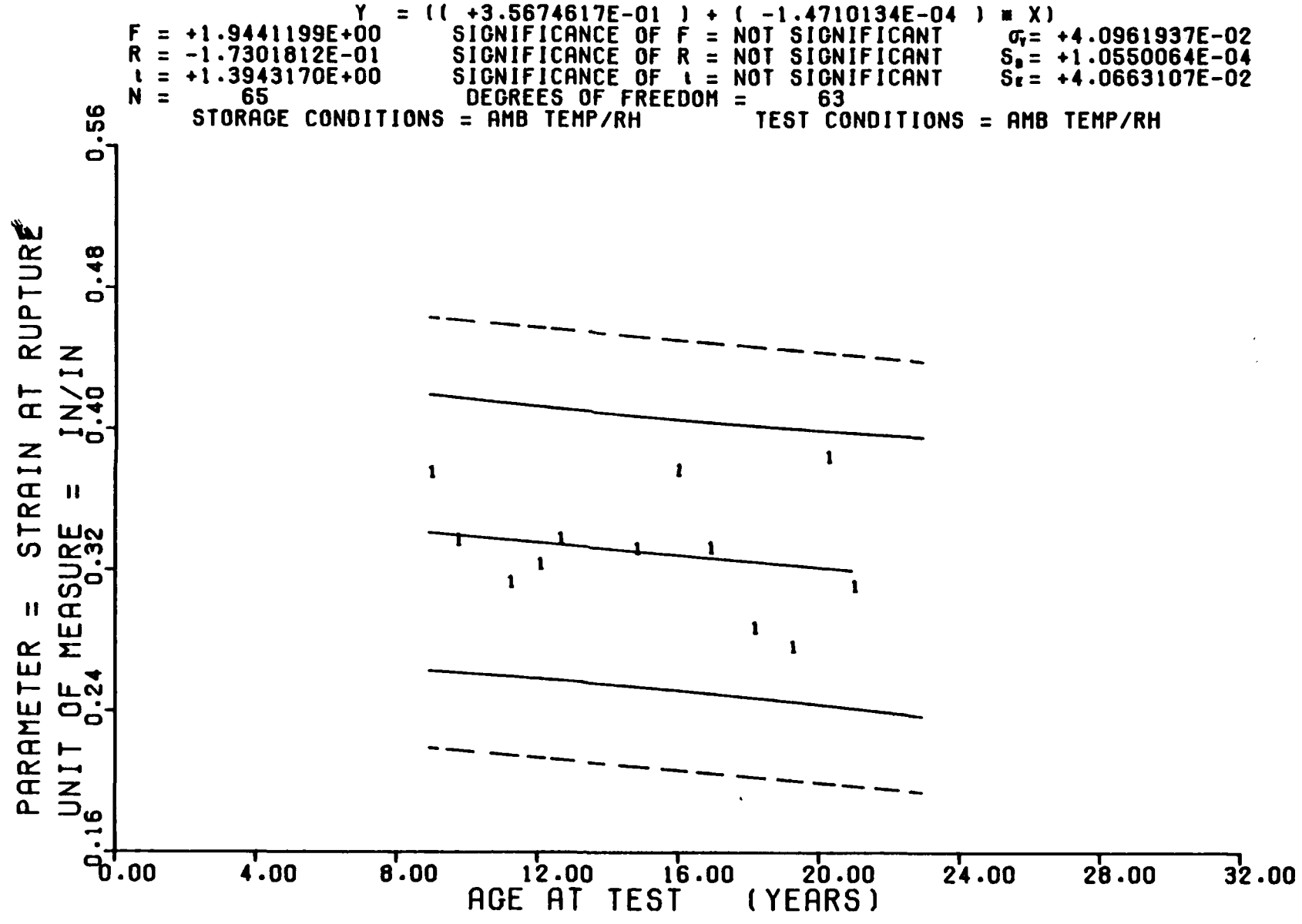

Y = ((+3.5674617E-01) + (-1.4710134E-04) * X)
F = +1.9441199E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY= +4.0961937E-02
R = -1.7301812E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb= +1.0550064E-04
t = +1.3943170E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se= +4.0663107E-02
N = 65 DEGREES OF FREEDOM = 63
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.56
0.48
0.40
0.32
0.24
0.16
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISSECTED MOTOR=0012199.HIGH RATE CHS=1750 IN/MIN.STRAIN AT RUPTURE.

Figure 13

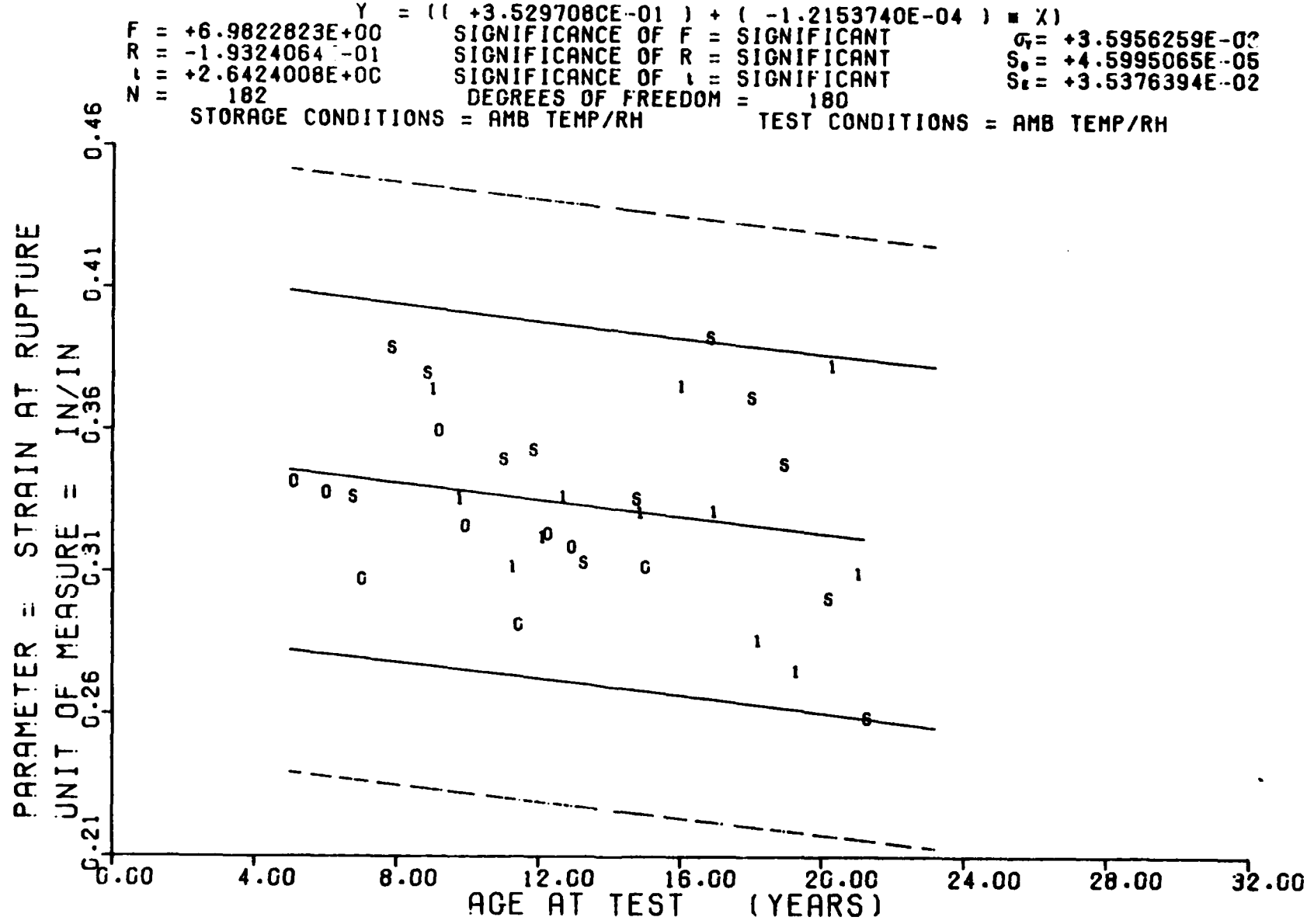

Y = ((+3.529708CE-01) + (-1.2153740E-04) ■ X)
F = +6.9822823E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = -1.9324064 -01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.6424008E+0C SIGNIFICANCE OF t = SIGNIFICANT
N = 182 DEGREES OF FREEDOM = 180
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.46
0.41
0.36
0.31
0.26
0.21
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTORS,HIGH RATE CHS=1750 IN/MIN,STRAIN AT RUPTURE

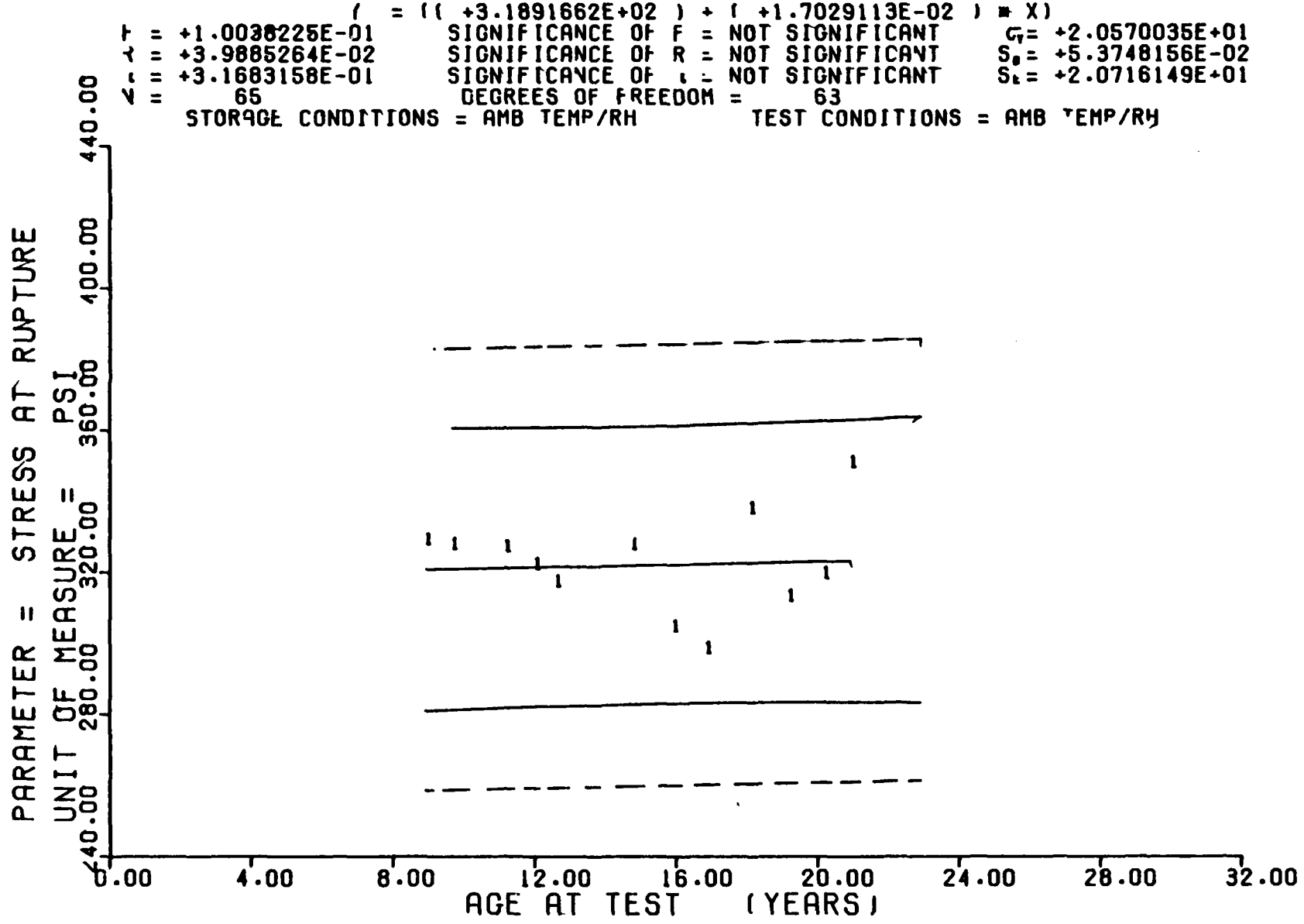
Figure 13A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

[illegible] (DEGREES)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
197.0	5	+3.7259978E-01	+1.9337545E-02	+3.9499994E-01	+3.4299999E-01	+3.4100627E-01
198.0	6	+3.3416634E-01	+1.3734733E-02	+3.5599999E-01	+3.1799995E-01	+3.3968240E-01
199.0	5	+3.1019973E-01	+1.4721062E-02	+3.2389998E-01	+2.8869998E-01	+3.3703458E-01
200.0	5	+3.2057970E-01	+3.6439853E-02	+3.6219996E-01	+2.6959997E-01	+3.3566354E-01
201.0	5	+3.3499962E-01	+1.6821783E-02	+3.6099994E-01	+3.1099998E-01	+3.3453387E-01
177.0	6	+3.2949972E-01	+1.2130367E-02	+3.4879994E-01	+3.1519997E-01	+3.3070921E-01
191.0	5	+3.7401962E-01	+1.8145567E-02	+3.9229995E-01	+3.4649997E-01	+3.2864981E-01
202.0	6	+3.2999956E-01	+4.7064620E-02	+3.9599996E-01	+2.8399997E-01	+3.2703167E-01
217.0	5	+2.8459984E-01	+1.2097074E-02	+2.9599994E-01	+2.7099996E-01	+3.2482516E-01
220.0	5	+3.7379989E-01	+9.3600495E-03	+3.8299999E-01	+3.6099997E-01	+3.2291281E-01
192.0	6	+3.8133299E-01	+5.3763365E-02	+4.2099994E-01	+2.8899997E-01	+3.2114762E-01
221.0	6	+3.0816650E-01	+2.0431704E-02	+3.2999996E-01	+2.7699995E-01	+3.1982374E-01

STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,STRAIN AT RUPTURE.



STAGE 1.DISSECTED MOTOR=0012199.HIGH RATE CHS=1750 IN/MIN.STRESS AT RUPTURE.

Figure 14

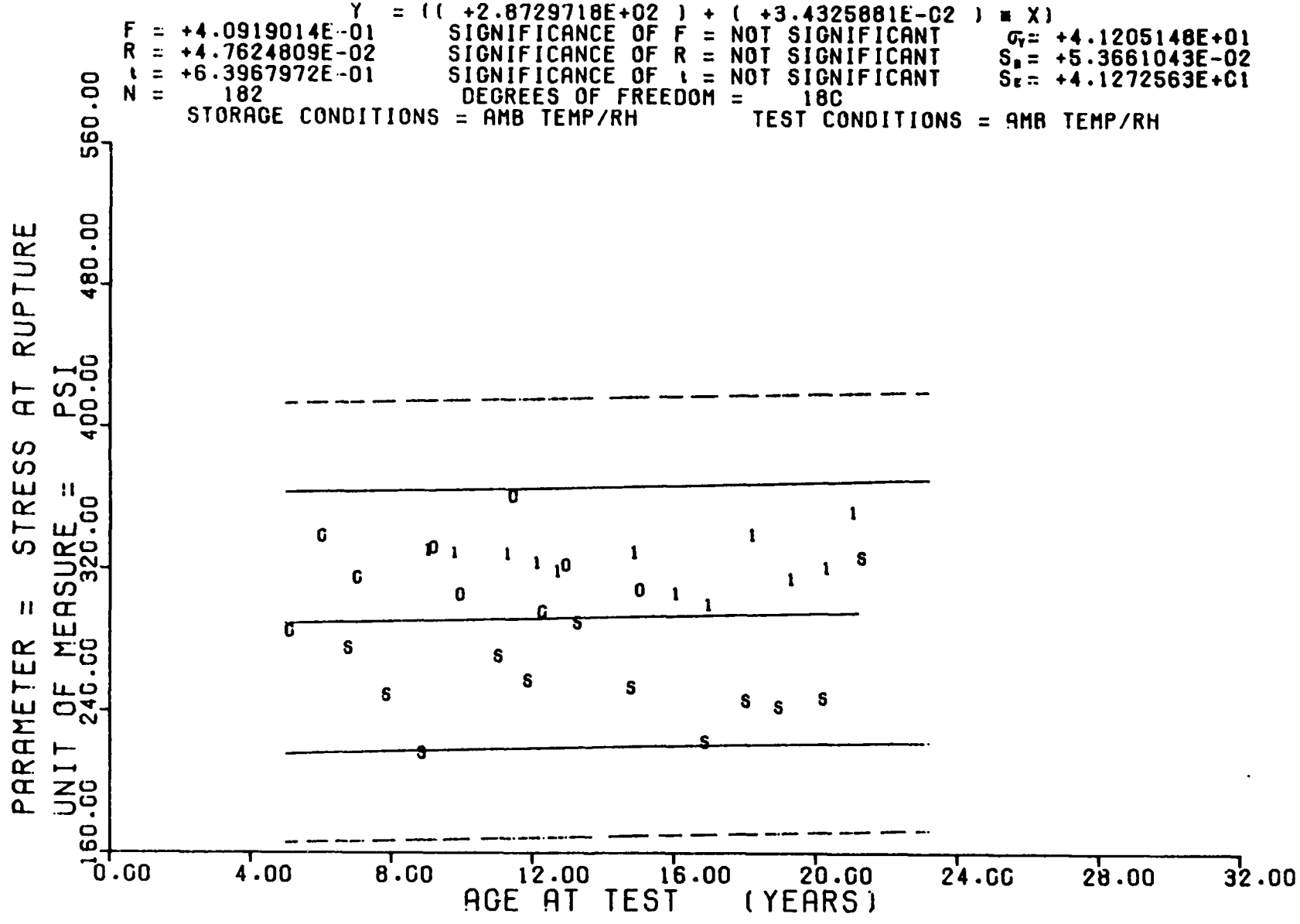

Y = ((+2.8729718E+02) + (+3.4325881E-02) * X)
F = +4.0919014E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σY= +4.1205148E+01
R = +4.7624809E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT SB= +5.3661043E-02
t = +6.3967972E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT SE= +4.1272563E+01
N = 182 DEGREES OF FREEDOM = 180
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
560.00
480.00
400.00
320.00
240.00
160.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISSECTED MOTORS,HIGH RATE CHS=1750 IN/MIN,STRESS AT RUPTURE

Figure 14A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (HOURS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	5	+3.2600000E+02	+7.5828754E+00	+3.3500000E+02	+3.2000000E+02	+3.2073852E+02
110.0	6	+3.2666650E+02	+7.5277265E+00	+3.3500000E+02	+3.2000000E+02	+3.2089184E+02
134.0	5	+3.2600366E+02	+1.3442233E+01	+3.4665991E+02	+3.1779980E+02	+3.2119848E+02
144.0	5	+3.2095385E+02	+2.4116321E+01	+3.3671997E+02	+2.9500000E+02	+3.2136865E+02
151.0	5	+3.1607983E+02	+1.1130769E+01	+3.3369995E+02	+3.0629980E+02	+3.2148779E+02
177.0	6	+3.2660986E+02	+1.5344678E+01	+3.5564990E+02	+3.0910986E+02	+3.2193066E+02
191.0	5	+3.0360791E+02	+3.2340114E+00	+3.0697998E+02	+3.0126977E+02	+3.2216894E+02
202.0	6	+2.9739990E+02	+3.4163447E+01	+3.3969995E+02	+2.6409985E+02	+3.2235644E+02
217.0	5	+3.3689990E+02	+4.1860334E+00	+3.4129980E+02	+3.3139990E+02	+3.2261181E+02
250.0	5	+3.1197998E+02	+5.6807723E+00	+3.1919995E+02	+3.0300000E+02	+3.2283325E+02
264.0	6	+3.1836645E+02	+2.2071578E+01	+3.6150000E+02	+2.9909985E+02	+3.2303759E+02
281.0	6	+3.4976660E+02	+1.4733102E+01	+3.7650000E+02	+3.3569995E+02	+3.2319091E+02

- 54 -

STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,STRESS AT RUPTURE.

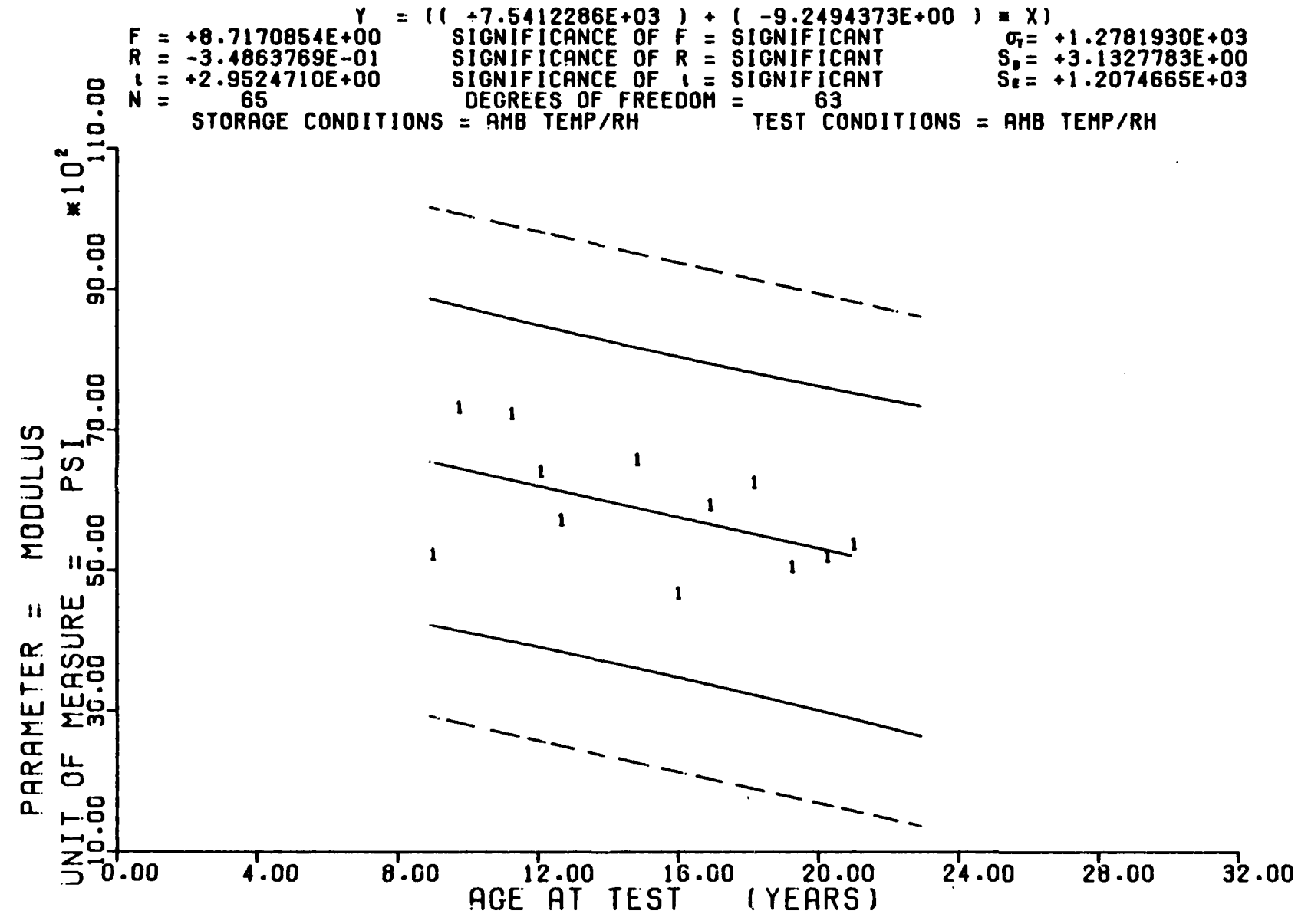
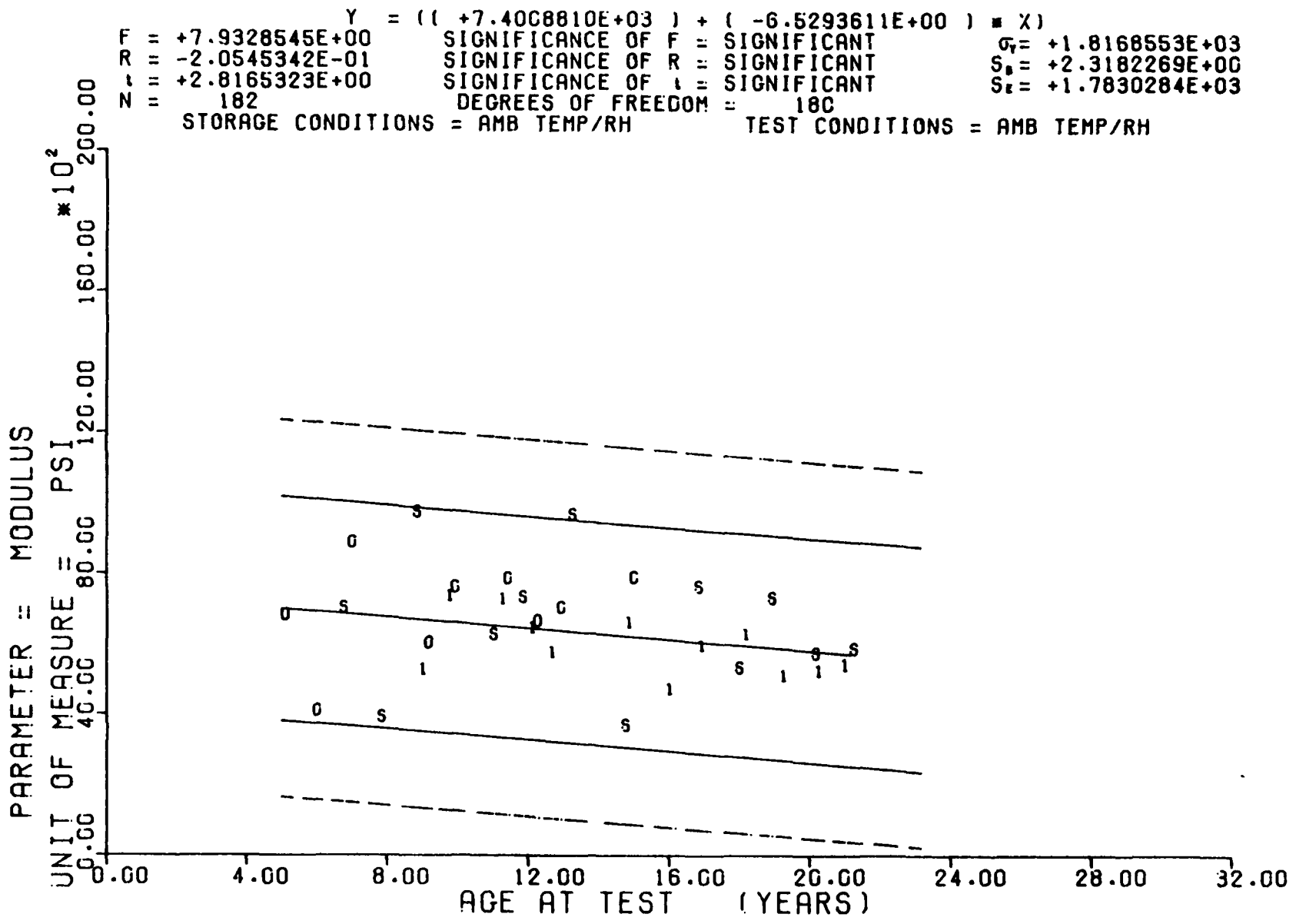

Y = ((+7.5412286E+03) + (-9.2494373E+00) * X)
F = +8.7170854E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = -3.4863769E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.9524710E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 65 DEGREES OF FREEDOM = 63
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
σY= +1.2781930E+03
SB= +3.1327783E+00
Sε= +1.2074665E+03
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
110.00
90.00
70.00
50.00
30.00
10.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISSECTED MOTOR=0012199.HIGH RATE CHS=1750 IN/MIN.MODULUS.

Figure 15



STAGE 1 DISSECTED MOTORS.HIGH RATE CHS=1750 IN/MIN.MODULUS

Figure 15A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	5	+5.1600000E+03	+2.6076809E+02	+5.3000000E+03	+4.7000000E+03	+6.5515351E+03
116.0	6	+7.2500000E+03	+4.7217115E+02	+7.9000000E+03	+6.9000000E+03	+6.4682929E+03
134.0	5	+7.1641992E+03	+1.6984928E+03	+9.2520000E+03	+4.7720000E+03	+6.3018007E+03
144.0	5	+6.3445976E+03	+1.1460434E+03	+7.5060000E+03	+4.4890000E+03	+6.2093085E+03
151.0	5	+5.6535976E+03	+1.2763544E+03	+6.7050000E+03	+4.0070000E+03	+6.1445625E+03
177.0	6	+6.5138320E+03	+1.5559174E+03	+8.4660000E+03	+4.2250000E+03	+5.9040781E+03
191.0	5	+4.6150000E+03	+1.1466537E+03	+5.9510000E+03	+3.4780000E+03	+5.7745859E+03
202.0	6	+5.8655000E+03	+5.8876727E+02	+6.6660000E+03	+5.1120000E+03	+5.6728398E+03
217.0	5	+6.1871992E+03	+1.8067429E+02	+6.4400000E+03	+5.9700000E+03	+5.5340976E+03
230.0	5	+4.9920000E+03	+1.5038772E+03	+6.2230000E+03	+2.2550000E+03	+5.4138554E+03
242.0	6	+5.1380000E+03	+1.0026835E+03	+7.0570000E+03	+4.2330000E+03	+5.3028632E+03
251.0	6	+5.3113320E+03	+6.8442520E+02	+6.2910000E+03	+4.6170000E+03	+5.2196171E+03

STAGE 1,DISSECTED MOTOR=0012199,HIGH RATE CHS=1750 IN/MIN,MODULUS.

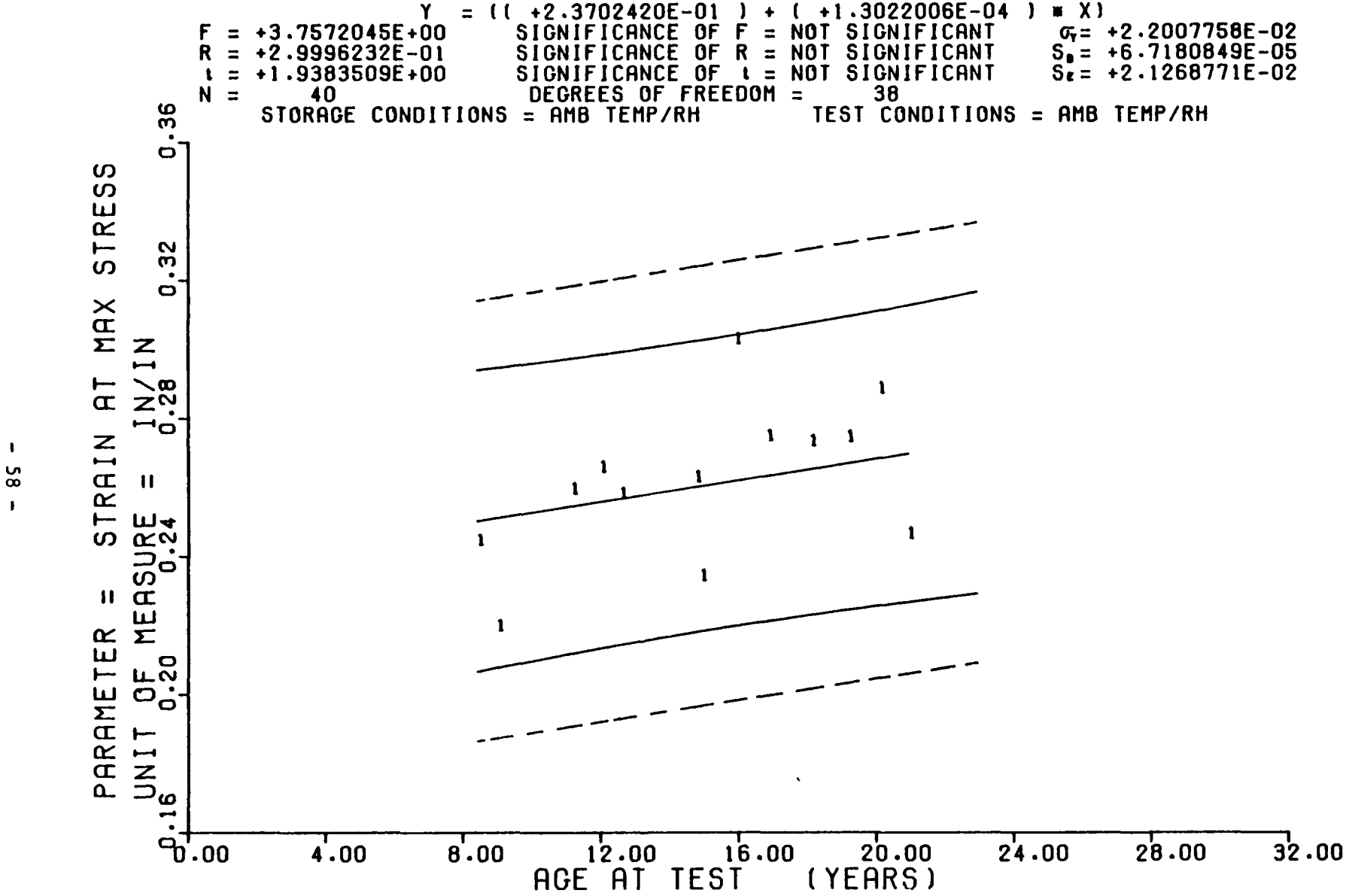

Y = ((+2.3702420E-01) + (+1.3022006E-04) * X)
F = +3.7572045E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σT= +2.2007758E-02
R = +2.9996232E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb= +6.7180849E-05
t = +1.9383509E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se= +2.1268771E-02
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.36
0.32
0.28
0.24
0.20
0.16
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1,DISCTED MOTOR=0012199,TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRAIN MAX STRS.

Figure 16

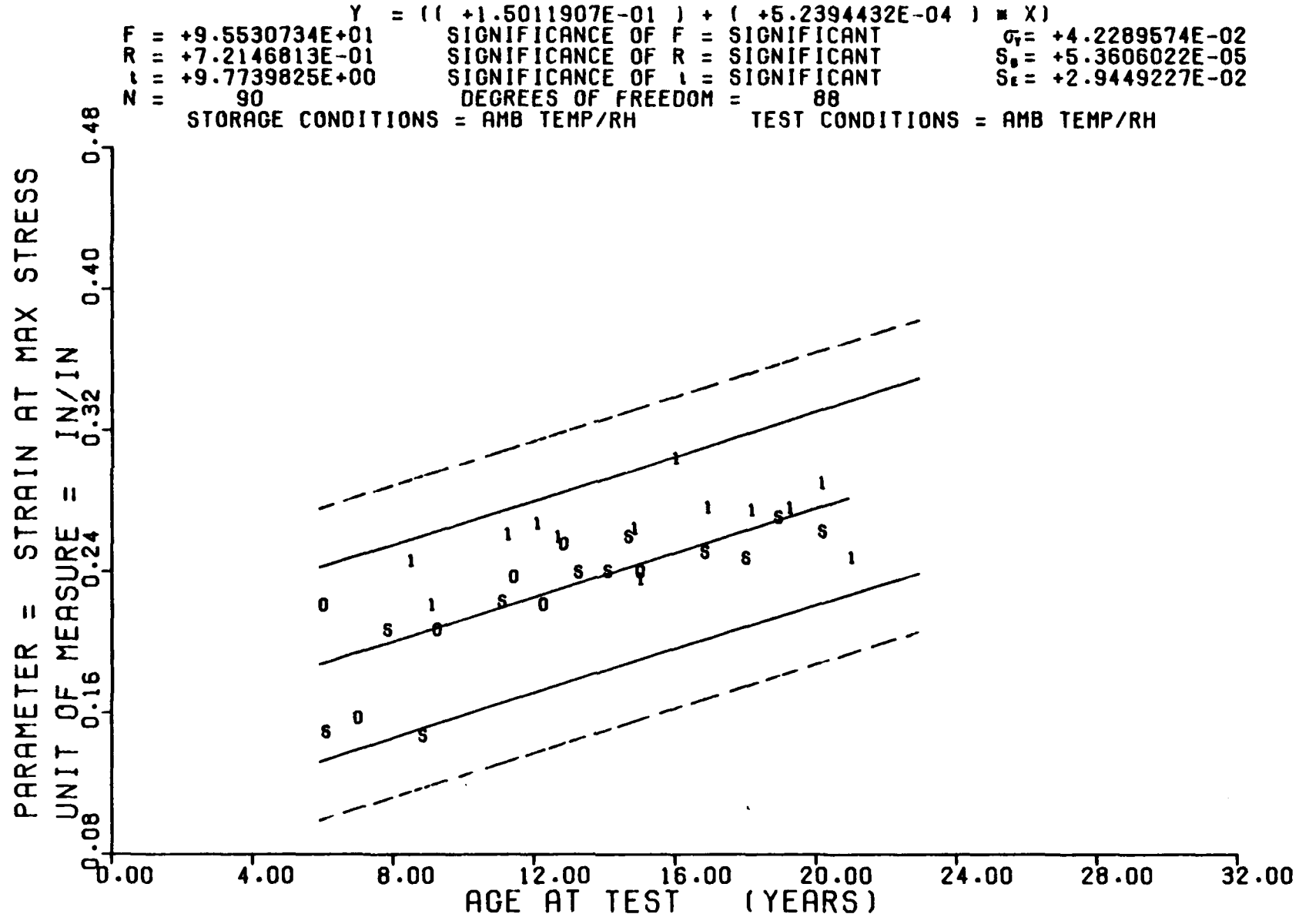

Y = ((+1.5011907E-01) + (+5.2394432E-04) * X)
F = +9.5530734E+01 SIGNIFICANCE OF F = SIGNIFICANT σT= +4.2289574E-02
R = +7.2146813E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb= +5.3606022E-05
t = +9.7739825E+00 SIGNIFICANCE OF t = SIGNIFICANT Se= +2.9449227E-02
N = 90 DEGREES OF FREEDOM = 88
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT MAX STRESS
UNIT OF MEASURE = IN/IN
0.08
0.16
0.24
0.32
0.40
0.48
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
DISSECTED TP-H1011,H.R.TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRAIN MAX STRS.

Figure 16A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
101.0	3	+2.4333328E-01	+1.0503744E-02	+2.5399994E-01	+2.3299998E-01	+2.5017642E-01
108.0	2	+2.1849995E-01	+7.7784373E-03	+2.2399997E-01	+2.1299999E-01	+2.5108796E-01
134.0	4	+2.5824975E-01	+2.3615550E-02	+2.8199994E-01	+2.3599994E-01	+2.5447368E-01
144.0	2	+2.6454997E-01	+1.7747857E-04	+2.6459997E-01	+2.6449996E-01	+2.5577586E-01
151.0	3	+2.5686663E-01	+4.0054300E-03	+2.6069998E-01	+2.5269997E-01	+2.5668740E-01
177.0	3	+2.6166659E-01	+1.1150359E-02	+2.6999998E-01	+2.4899995E-01	+2.6007312E-01
179.0	1	+2.3299998E-01	+0.0000000E+07	+2.3299998E-01	+2.3299998E-01	+2.6033353E-01
191.0	3	+3.0156660E-01	+9.2083226E-03	+3.0909997E-01	+2.9129999E-01	+2.6189619E-01
202.0	3	+2.7363330E-01	+4.9090398E-03	+2.7929997E-01	+2.7059996E-01	+2.6332861E-01
217.0	3	+2.7209997E-01	+1.8350040E-02	+2.8599995E-01	+2.5129997E-01	+2.6528191E-01
230.0	3	+2.7326661E-01	+7.5814519E-03	+2.7989995E-01	+2.6499998E-01	+2.6697480E-01
241.0	3	+2.8733325E-01	+5.5081478E-03	+2.9299998E-01	+2.8199994E-01	+2.6840722E-01
251.0	7	+2.4528557E-01	+4.2774511E-03	+2.5199997E-01	+2.4099999E-01	+2.6970940E-01

STAGE 1,DISCTED MOTOR=0012199.TRIAXIAL CHS=1750 IN/MIN.600 PSI.STRAIN MAX STRS.

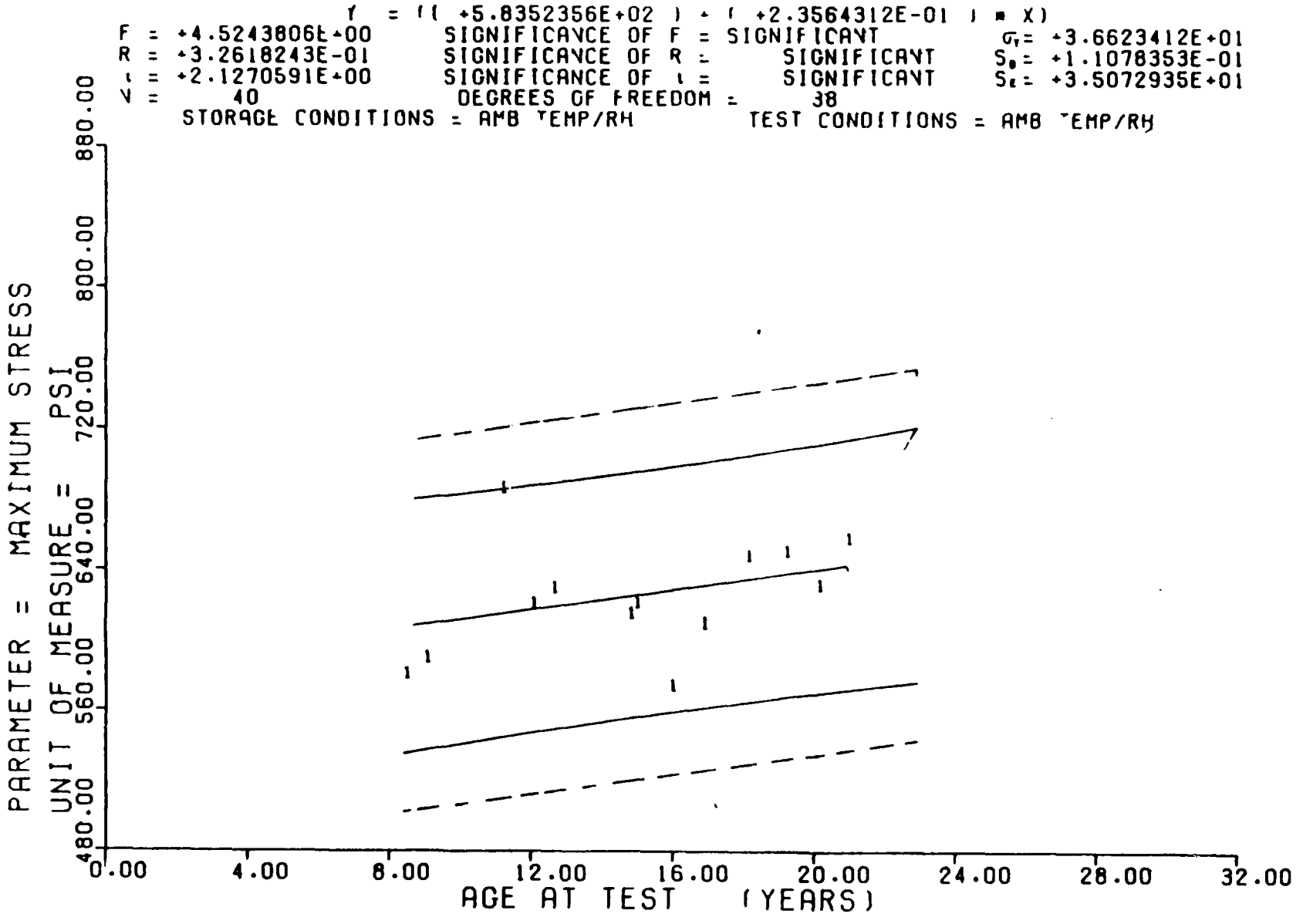
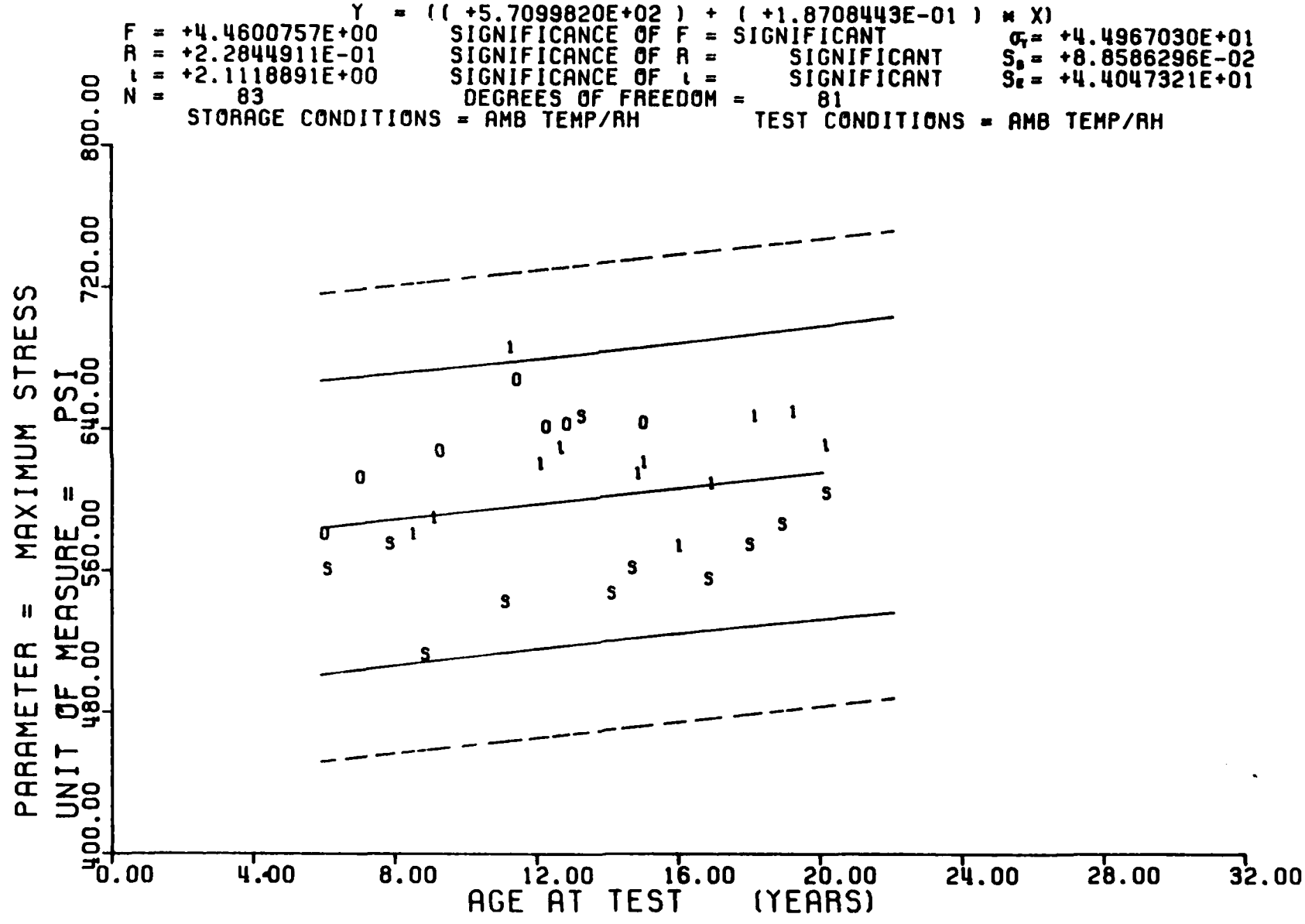

Y = (+5.8352356E+02) + (+2.3564312E-01) * X)
F = +4.5243806E+00 SIGNIFICANCE OF F = SIGNIFICANT σY = +3.6623412E+01
R = +3.2618243E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +1.1078353E-01
t = +2.1270591E+00 SIGNIFICANCE OF t = SIGNIFICANT Sε = +3.5072935E+01
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MAXIMUM STRESS
UNIT OF MEASURE = PSI
880.00
800.00
720.00
640.00
560.00
480.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.TRIAXIAL CHS=1750 IN/MIN.600 PSI.MAXIMUM STRESS.

Figure 17



DISSECTED TP-H1011,H.R.TRIAXIAL CHS=1750 IN/MIN,600 PSI,MAXIMUM STRESS

Figure 17A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
101.0	3	+5.7636303E+02	+3.3468439E+00	+5.8736987E+02	+5.7091992E+02	+6.0732348E+02
103.0	2	+5.8750000E+02	+3.5355339E+00	+5.9000000E+02	+5.8500000E+02	+6.0897290E+02
134.0	4	+6.0384935E+02	+1.7545287E+01	+7.0579980E+02	+6.0309985E+02	+6.1509960E+02
144.0	2	+6.1820439E+02	+1.7449432E+01	+6.3059985E+02	+6.0592993E+02	+6.1745605E+02
151.0	3	+6.2729321E+02	+1.1372668E+01	+6.3505981E+02	+6.1425000E+02	+6.1910546E+02
177.0	3	+6.1272973E+02	+1.1471972E+01	+6.2438989E+02	+6.0209985E+02	+6.2523217E+02
179.0	1	+6.1889990E+02	+0.0000000E+07	+6.1889990E+02	+6.1889990E+02	+6.2570361E+02
191.0	3	+5.7182324E+02	+9.0138333E+00	+5.7920996E+02	+5.6095996E+02	+6.2853125E+02
202.0	3	+6.0717651E+02	+5.5697278E+00	+6.1257983E+02	+6.0143994E+02	+6.3112329E+02
217.0	3	+6.4525976E+02	+2.4294783E+01	+6.7781982E+02	+6.2669995E+02	+6.3465795E+02
230.0	3	+6.4762304E+02	+1.1927594E+01	+6.5552978E+02	+6.3389990E+02	+6.3772143E+02
241.0	5	+6.2386937E+02	+1.2232940E+01	+6.4069995E+02	+6.1616992E+02	+6.4031347E+02
251.0	7	+6.3520361E+02	+5.1246162E+01	+6.8344995E+02	+5.8785986E+02	+6.4266992E+02

STAGE 1,DISCTED MOTOR=0012199,TRIAXIAL CHS=1750 IN/MIN,600 PSI,MAXIMUM STRESS.

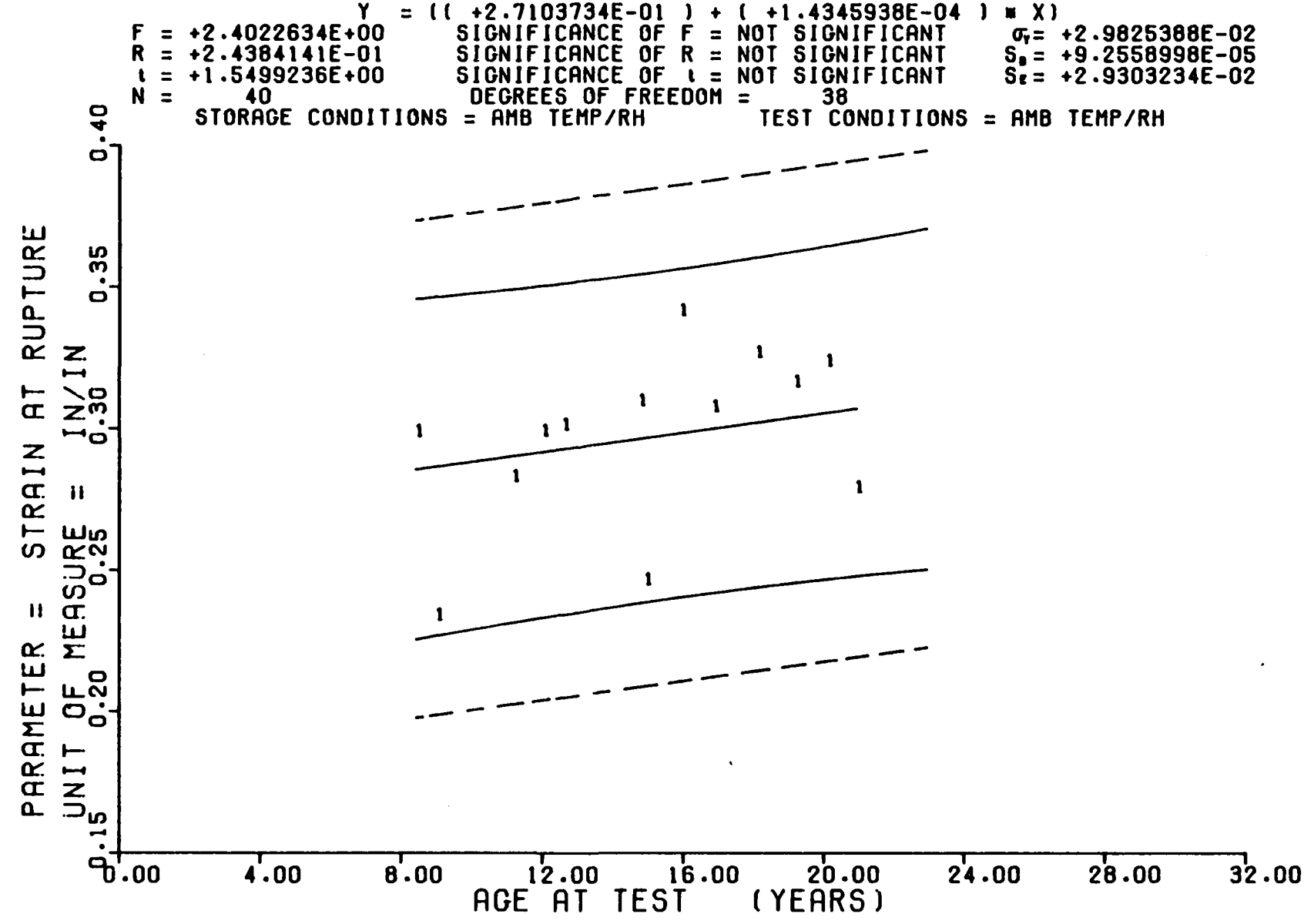

Y = ((+2.7103734E-01) + (+1.4345938E-04) * X)
F = +2.4022634E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +2.9825388E-02
R = +2.4384141E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_B = +9.2558998E-05
t = +1.5499236E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_E = +2.9303234E-02
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.40
0.35
0.30
0.25
0.20
0.15
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.TRIAXIAL CHS=1750 IN/MIN.600 PSI.STRAIN AT RUPT.

Figure 18

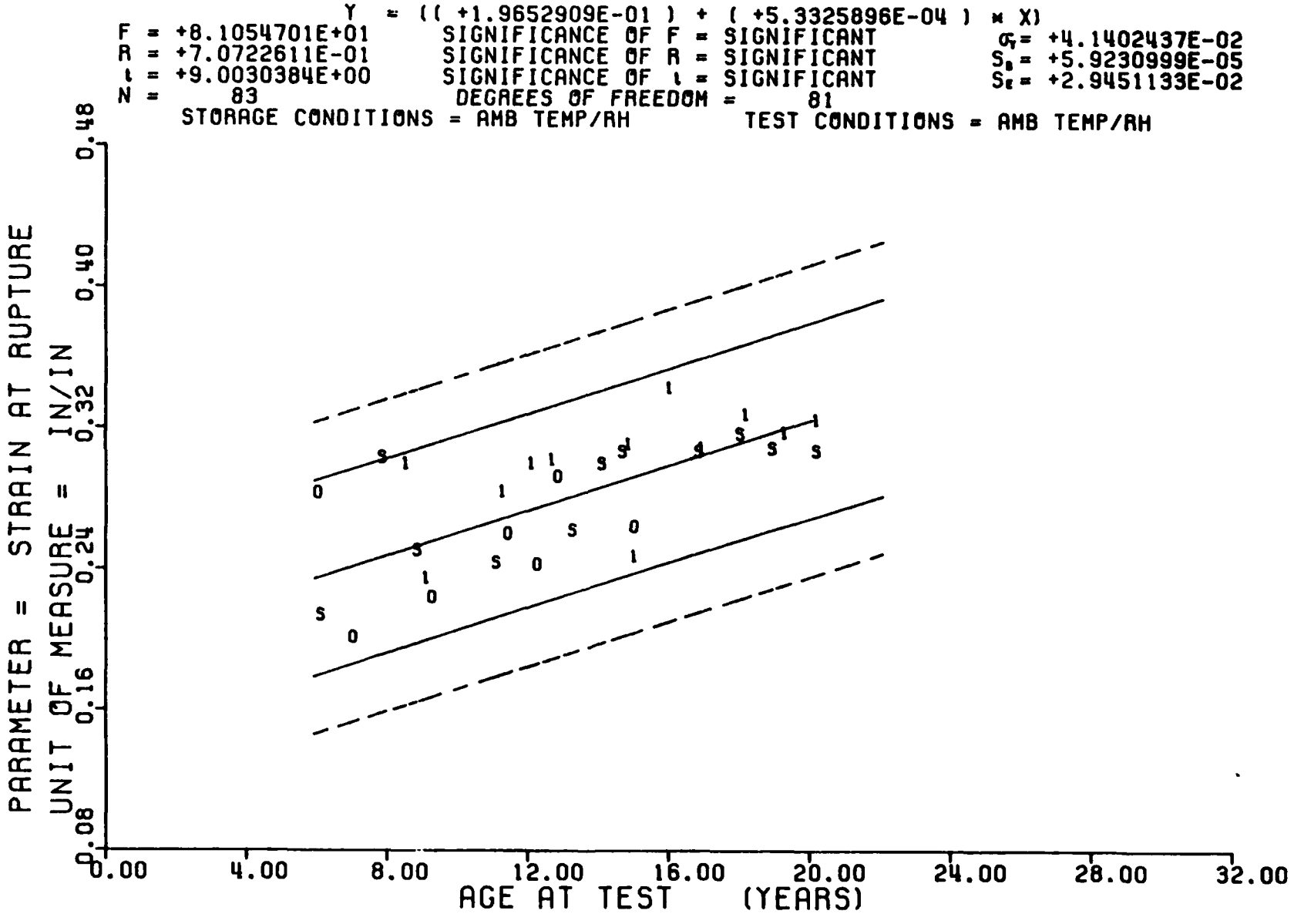

Y = ((+1.9652909E-01) + (+5.3325896E-04) * X)
F = +8.1054701E+01 SIGNIFICANCE OF F = SIGNIFICANT σ = +4.1402437E-02
R = +7.0722611E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +5.9230999E-05
t = +9.0030384E+00 SIGNIFICANCE OF t = SIGNIFICANT S_ε = +2.9451133E-02
N = 83 DEGREES OF FREEDOM = 81
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = IN/IN
0.08
0.16
0.24
0.32
0.40
0.48
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
DISSECTED TP-H1011,H.R.TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRAIN AT RUPTURE

Figure 18A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
101.0	3	+2.9733324E-01	+1.6041907E-02	+3.1399995E-01	+2.8199994E-01	+2.8552669E-01
108.0	2	+2.3249995E-01	+1.2021142E-02	+2.4099999E-01	+2.2399997E-01	+2.8653091E-01
134.0	4	+2.8149986E-01	+2.9012293E-02	+3.0699998E-01	+2.5299996E-01	+2.9026085E-01
144.0	2	+2.9749995E-01	+9.7593888E-03	+3.0439996E-01	+2.9059994E-01	+2.9169547E-01
151.0	3	+2.9966658E-01	+1.2503392E-02	+3.1399995E-01	+2.9099994E-01	+2.9269969E-01
177.0	3	+3.0833327E-01	+2.0647064E-02	+3.3199995E-01	+2.9399996E-01	+2.9642963E-01
179.0	1	+2.4499994E-01	+0.0000000E+07	+2.4499994E-01	+2.4499994E-01	+2.9671657E-01
191.0	3	+3.4026652E-01	+5.4680221E-03	+3.4589999E-01	+3.3499997E-01	+2.9843807E-01
202.0	3	+3.0616664E-01	+4.9918559E-03	+3.1169998E-01	+3.0199998E-01	+3.0001610E-01
217.0	3	+3.2533329E-01	+3.7166382E-02	+3.5599994E-01	+2.8399997E-01	+3.0216801E-01
230.0	3	+3.1499993E-01	+1.5522556E-02	+3.2999998E-01	+2.9899996E-01	+3.0403298E-01
241.0	3	+3.2233327E-01	+9.2899460E-03	+3.2999998E-01	+3.1199997E-01	+3.0561101E-01
251.0	7	+2.7771401E-01	+9.9008212E-03	+2.8899997E-01	+2.6599997E-01	+3.0704563E-01

STAGE 1,DISCTED MCTOR=0012199,TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRAIN AT RUPT.

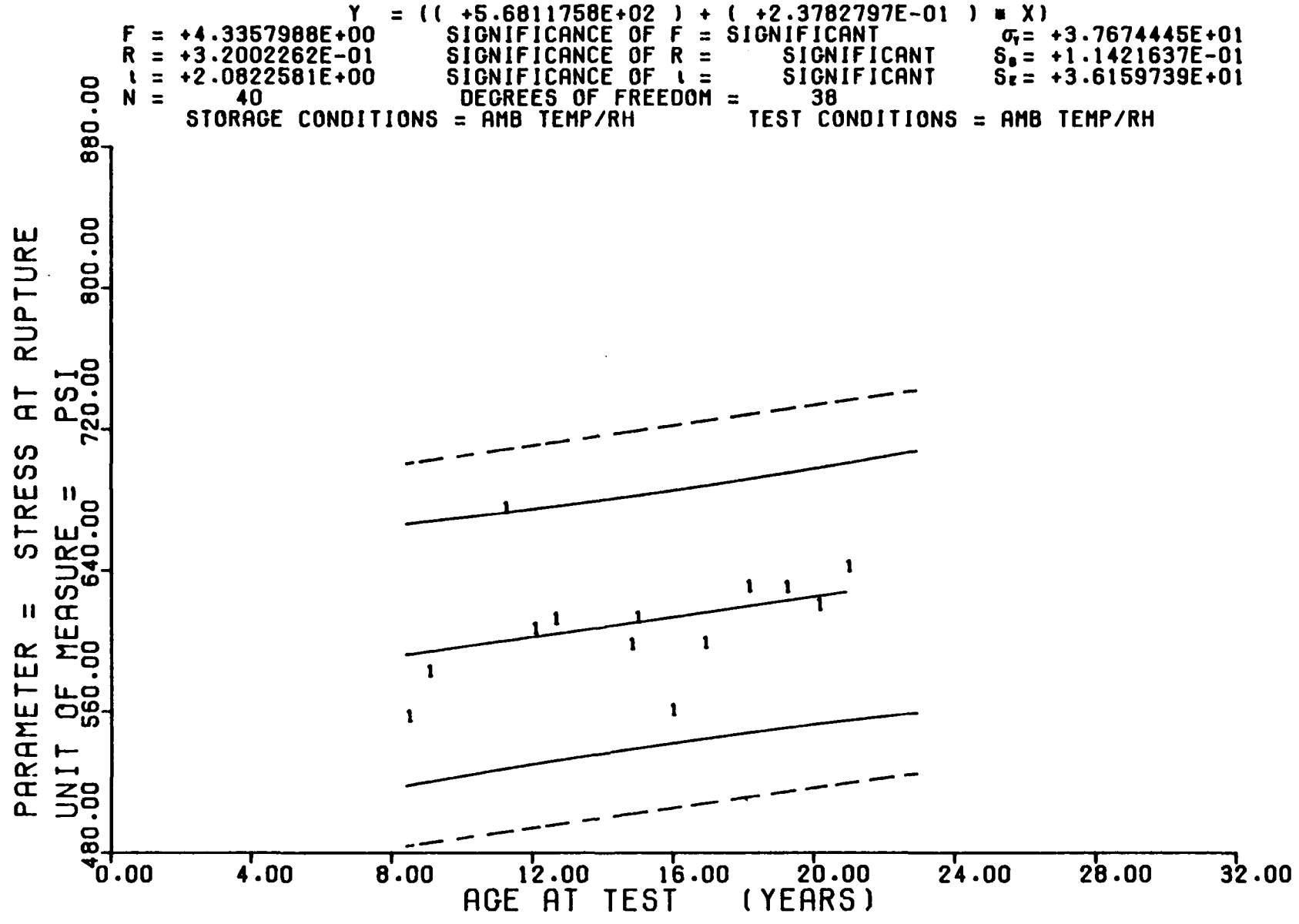
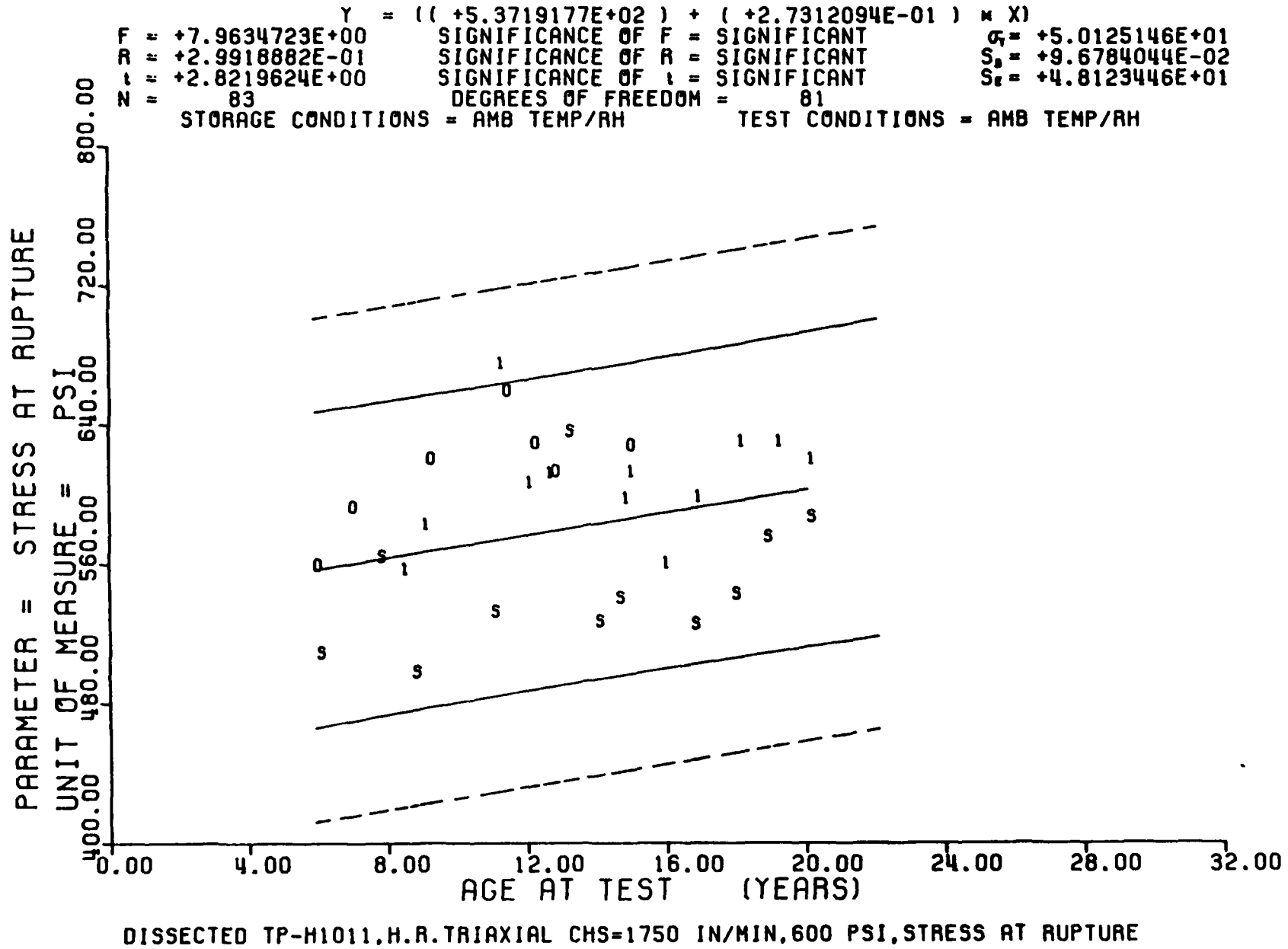

Y = ((+5.6811758E+02) + (+2.3782797E-01) * X)
F = +4.3357988E+00 SIGNIFICANCE OF F = SIGNIFICANT σT= +3.7674445E+01
R = +3.2002262E-01 SIGNIFICANCE OF R = SIGNIFICANT Se= +1.1421637E-01
t = +2.0822581E+00 SIGNIFICANCE OF t = SIGNIFICANT Sz= +3.6159739E+01
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS AT RUPTURE
UNIT OF MEASURE = PSI
480.00
560.00
640.00
720.00
800.00
880.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.TRIAXIAL CHS=1750 IN/MIN.600 PSI.STRESS AT RUPT.

Figure 19



DISSECTED TP-H1011,H.R.TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRESS AT RUPTURE

Figure 19A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
101.0	3	+5.5439990E+02	+1.2138417E+01	+5.6789990E+02	+5.4439990E+02	+5.9213818E+02
108.0	2	+5.8000000E+02	+7.0710678E+00	+5.8500000E+02	+5.7500000E+02	+5.9380297E+02
134.0	4	+6.7267480E+02	+1.7404708E+01	+6.9689990E+02	+6.5550000E+02	+5.9998632E+02
144.0	2	+6.0435473E+02	+1.9063322E+01	+6.1782983E+02	+5.9087988E+02	+6.0236474E+02
151.0	3	+6.0989990E+02	+8.8692548E+00	+6.1939990E+02	+6.0179980E+02	+6.0402954E+02
177.0	3	+5.9539990E+02	+9.6067201E+00	+6.0519995E+02	+5.8600000E+02	+6.1021289E+02
179.0	1	+6.1069995E+02	+0.0000000E+07	+6.1069995E+02	+6.1069995E+02	+6.1068872E+02
191.0	3	+5.5800976E+02	+1.0816872E+01	+5.7008984E+02	+5.4922998E+02	+6.1354248E+02
202.0	3	+5.9619628E+02	+5.5844651E+00	+6.0226977E+02	+5.9129980E+02	+6.1615869E+02
217.0	3	+6.2813305E+02	+3.5056925E+01	+6.6859985E+02	+6.0700000E+02	+6.1972607E+02
230.0	3	+6.2783325E+02	+2.0557519E+01	+6.4489990E+02	+6.0500000E+02	+6.2281787E+02
241.0	3	+6.1773974E+02	+9.8289121E+00	+6.2750000E+02	+6.0781982E+02	+6.2543408E+02
251.0	7	+6.3955517E+02	+3.0278197E+01	+6.6539990E+02	+5.7469995E+02	+6.2781225E+02

STAGE 1,DISCTLD MOTOR=0012199,TRIAXIAL CHS=1750 IN/MIN,600 PSI,STRESS AT RUPT.

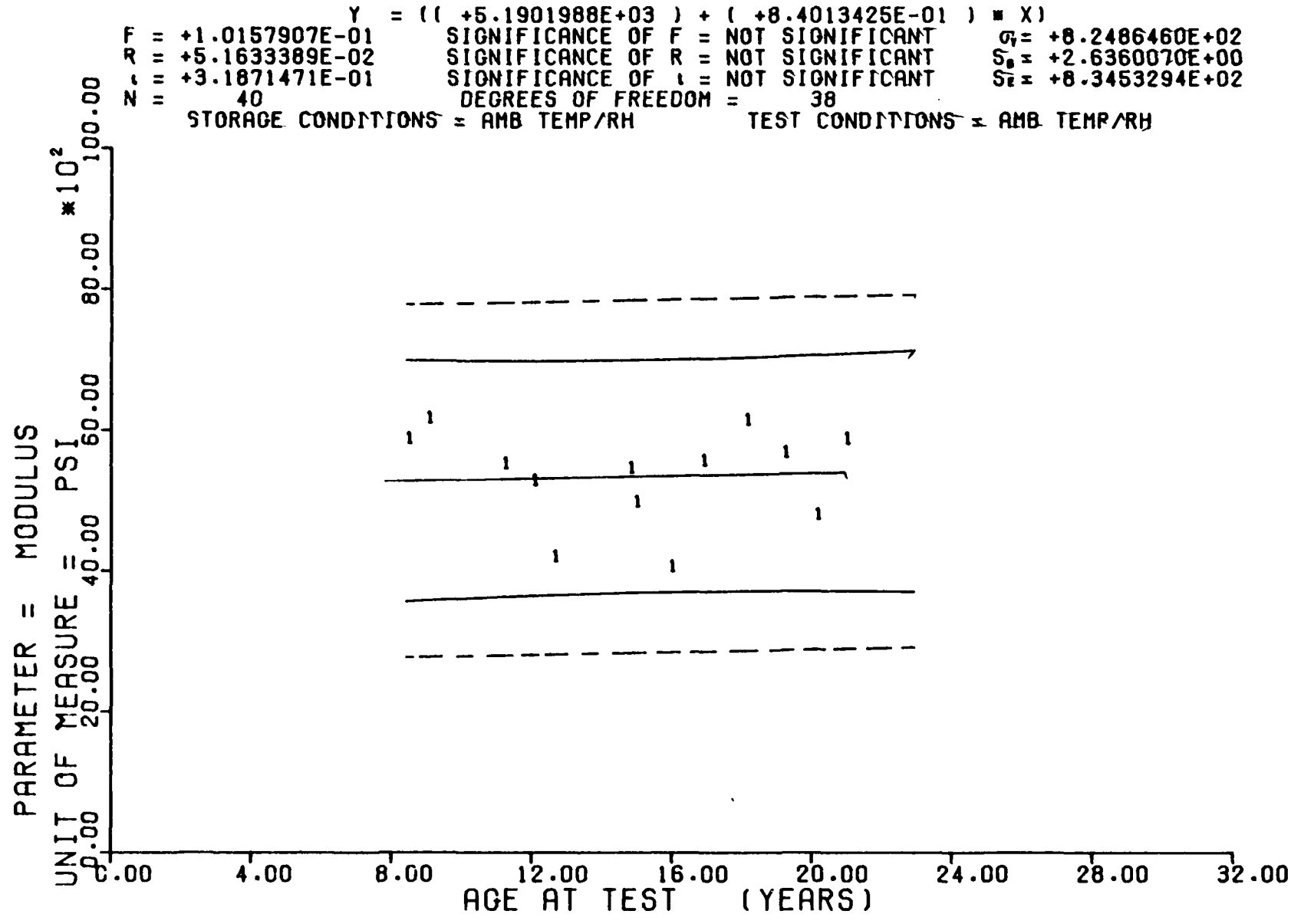
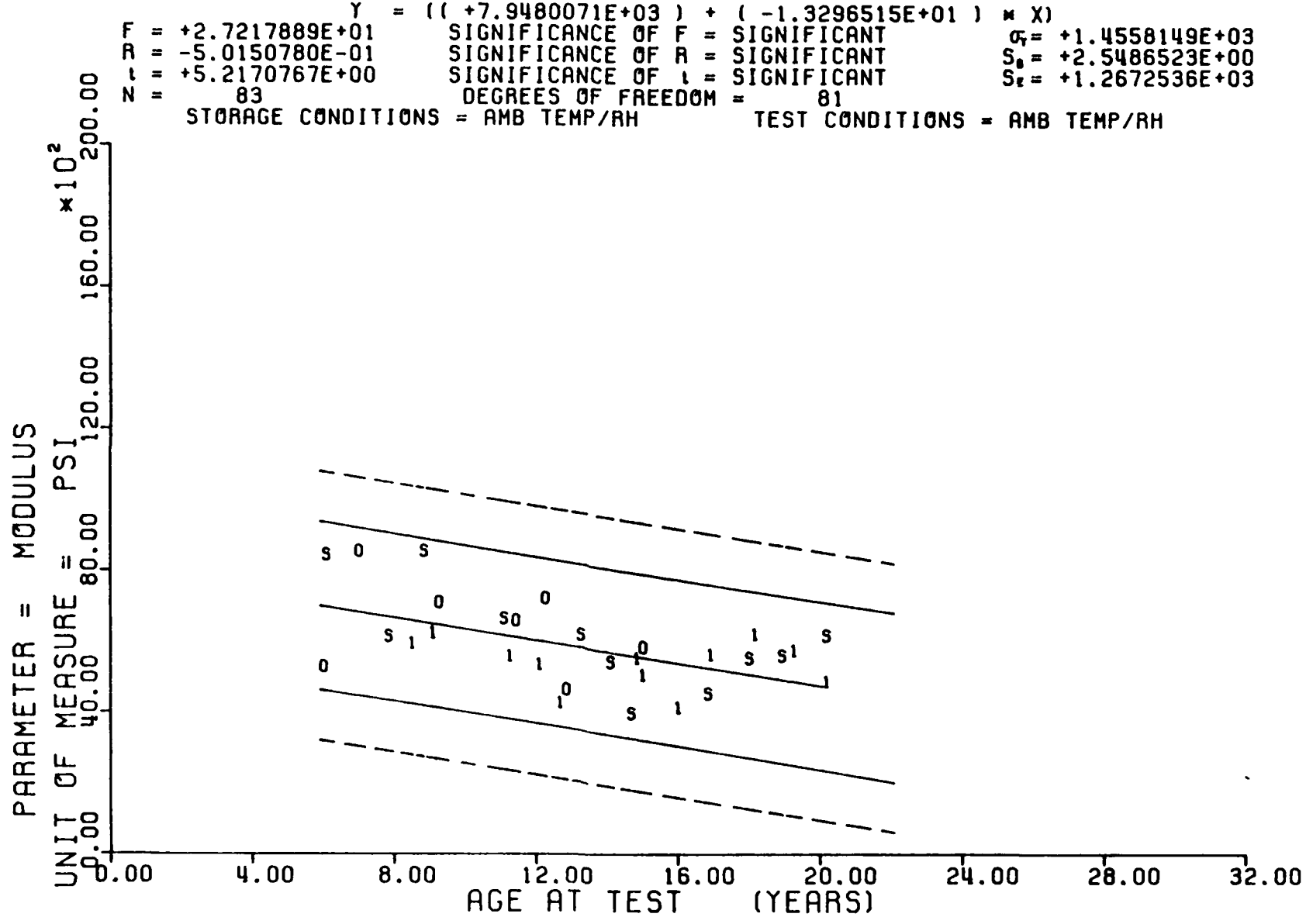

Y = ((+5.1901988E+03) + (+8.4013425E-01) * X)
F = +1.0157907E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1 = +8.2486460E+02
R = +5.1633389E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sβ = +2.6360070E+00
t = +3.1871471E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT Sε = +8.3453294E+02
N = 40 DEGREES OF FREEDOM = 38
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = MODULUS
UNIT OF MEASURE = PSI *10²
0.00
20.00
40.00
60.00
80.00
100.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.TRIAXIAL CHS=1750 IN/MIN.600 PSI.MODULUS.

Figure 20



DISSECTED TP-H1011,H.R.TRIAXIAL CHS=1750 IN/MIN,600 PSI,MODULUS

Figure 20A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

[illegible] (LAGGED)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
1[illegible].0	3	+5.3113320E+03	+3.9279426E+02	+6.1640000E+03	+5.3880000E+03	+5.2750507E+03
1[illegible].0	2	+6.1000000E+03	+1.4142135E+02	+6.2000000E+03	+6.0000000E+03	+5.2809296E+03
1[illegible].0	4	+5.4572500E+03	+1.4371835E+03	+7.5630000E+03	+4.4230000E+03	+5.3027734E+03
1[illegible].0	2	+5.2200000E+03	+4.5254833E+01	+5.2520000E+03	+5.1880000E+03	+5.3111757E+03
1[illegible].0	5	+4.1356640E+03	+5.8507421E+02	+4.7150000E+03	+3.5450000E+03	+5.3170585E+03
1[illegible].0	5	+5.3960000E+03	+7.2776919E+02	+6.0000000E+03	+4.5880000E+03	+5.3389023E+03
1[illegible].0	1	+4.9180000E+03	+0.0000000E+07	+4.9180000E+03	+4.9180000E+03	+5.3405820E+03
1[illegible].0	3	+5.0933332E+03	+2.1059281E+02	+4.2350000E+03	+3.8490000E+03	+5.3506640E+03
[illegible].0	3	+5.5020000E+03	+3.2701576E+02	+5.8790000E+03	+5.2950000E+03	+5.3599023E+03
21[illegible].0	3	+6.0786640E+03	+2.3596044E+02	+6.3510000E+03	+5.9350000E+03	+5.3725078E+03
[illegible].0	3	+5.6190000E+03	+5.6915283E+02	+6.0690000E+03	+5.0660000E+03	+5.3834257E+03
2[illegible].0	3	+4.7363320E+03	+1.4218239E+02	+4.8800000E+03	+4.5820000E+03	+5.3926679E+03
[illegible].0	7	+5.0148554E+03	+3.6410411E+02	+6.3960000E+03	+5.2840000E+03	+5.4010703E+03

STAGE 1,DISCTED MOTOR=0012199,TRIAXIAL CHS-1750 IN/MIN,600 PSI,MODULUS.

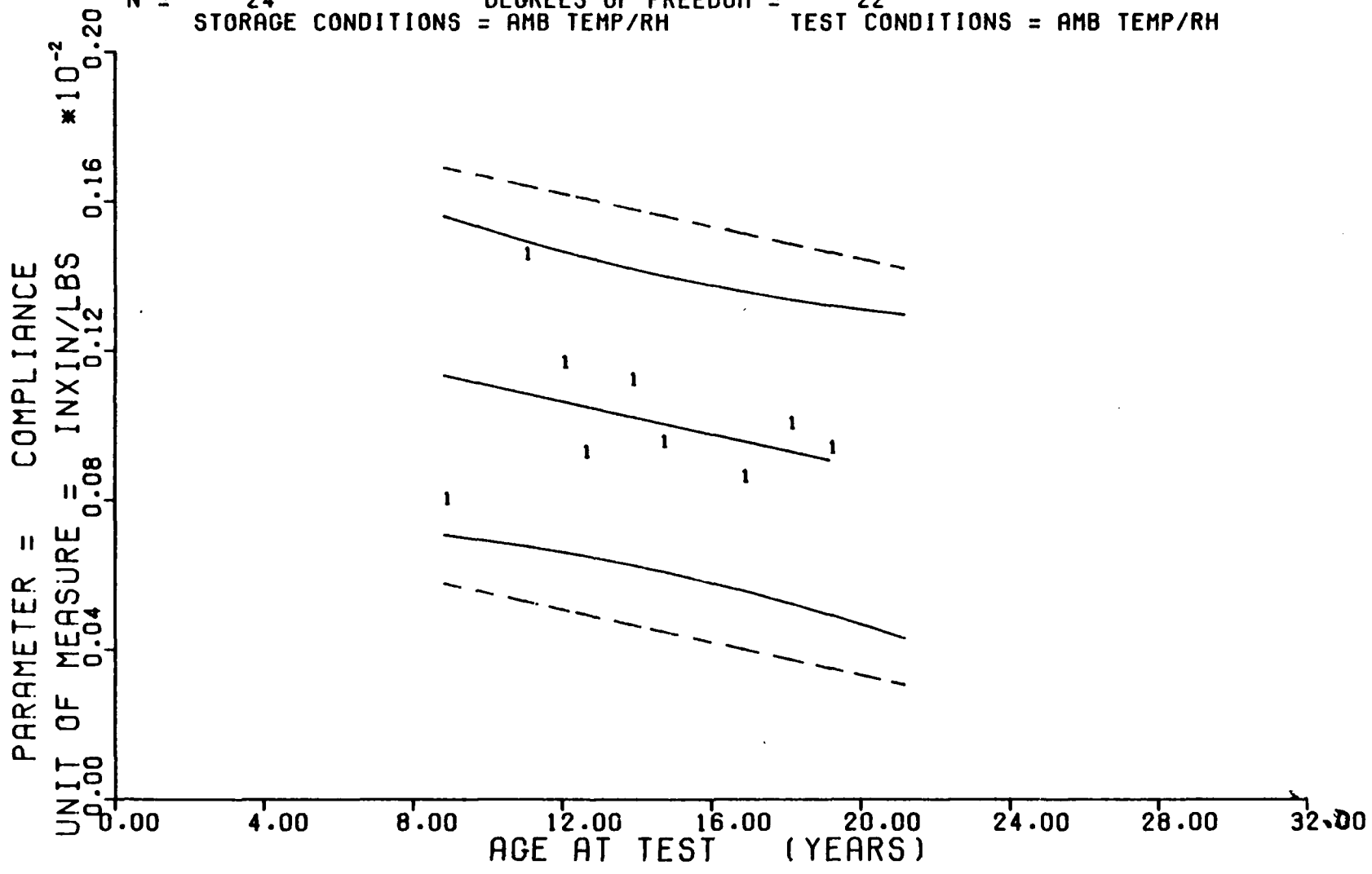
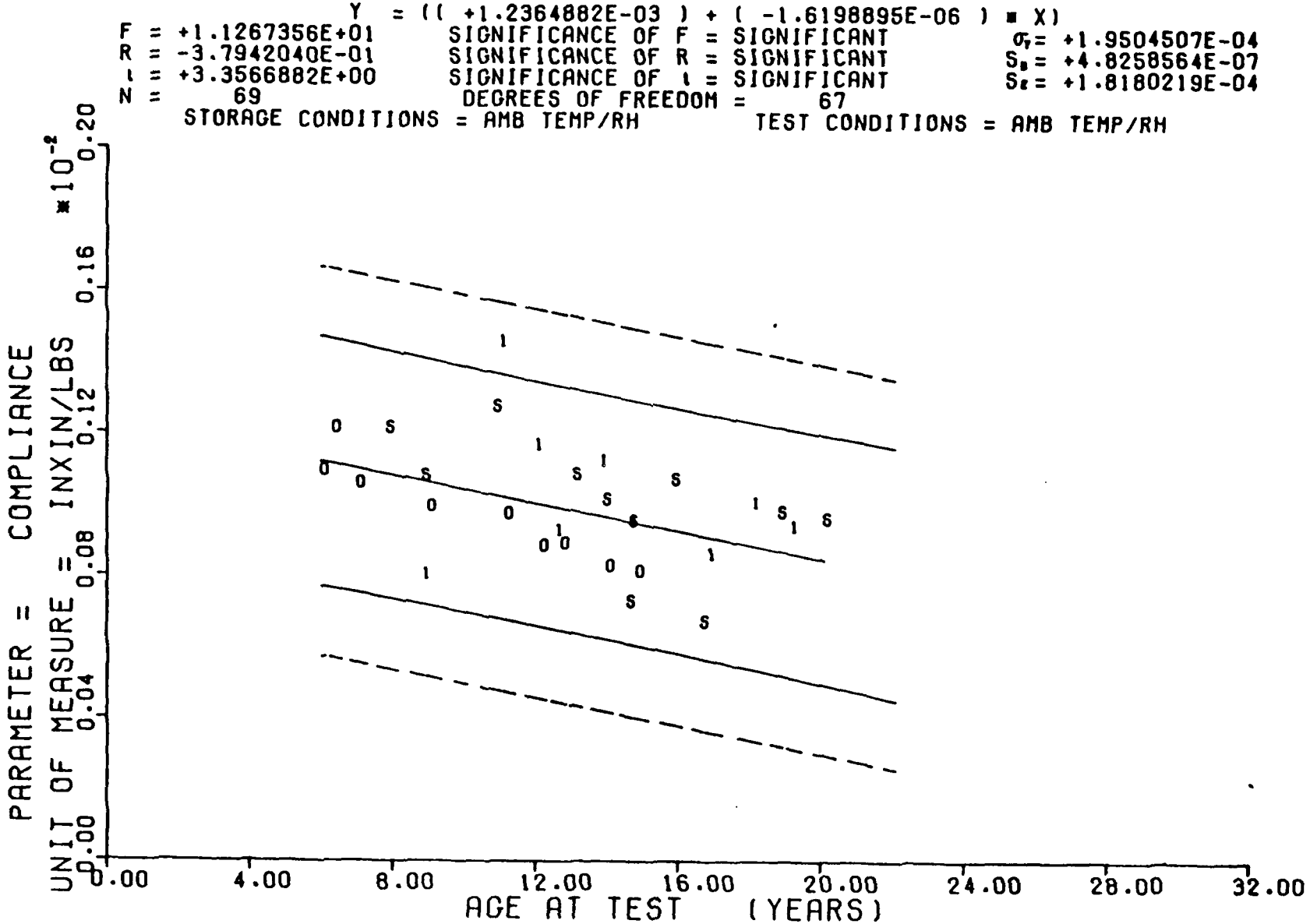

Y = ((+1.3265450E-03) + (-1.8222149E-06) * X)
F = +2.8423755E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σT= +1.9271515E-04
R = -3.3825495E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb= +1.0808337E-06
t = +1.6859346E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se= +1.8543137E-04
N = 24 DEGREES OF FREEDOM = 22
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COMPLIANCE
UNIT OF MEASURE = INXIN/LBS *10-2
0.00
0.04
0.08
0.12
0.16
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1,DISCTED MOTOR=0012099,CREEP 10 LB LOAD,COMPLIANCE AT 10 SEC.

Figure 21



DISSECTED MOTOR TP-H1011.CREEP 10 LB LOAD.COMPLIANCE AT 10 SEC.

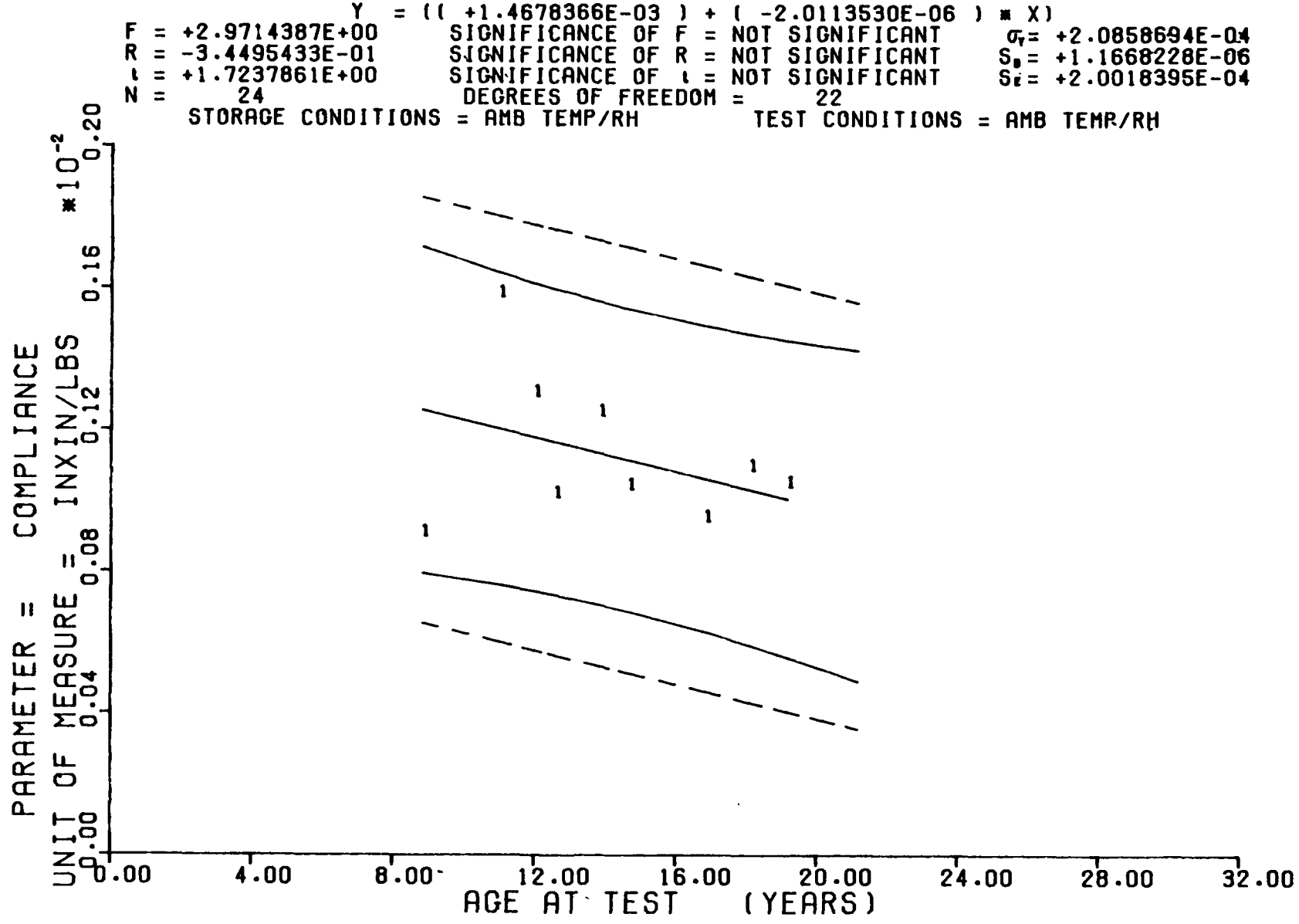
Figure 21A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

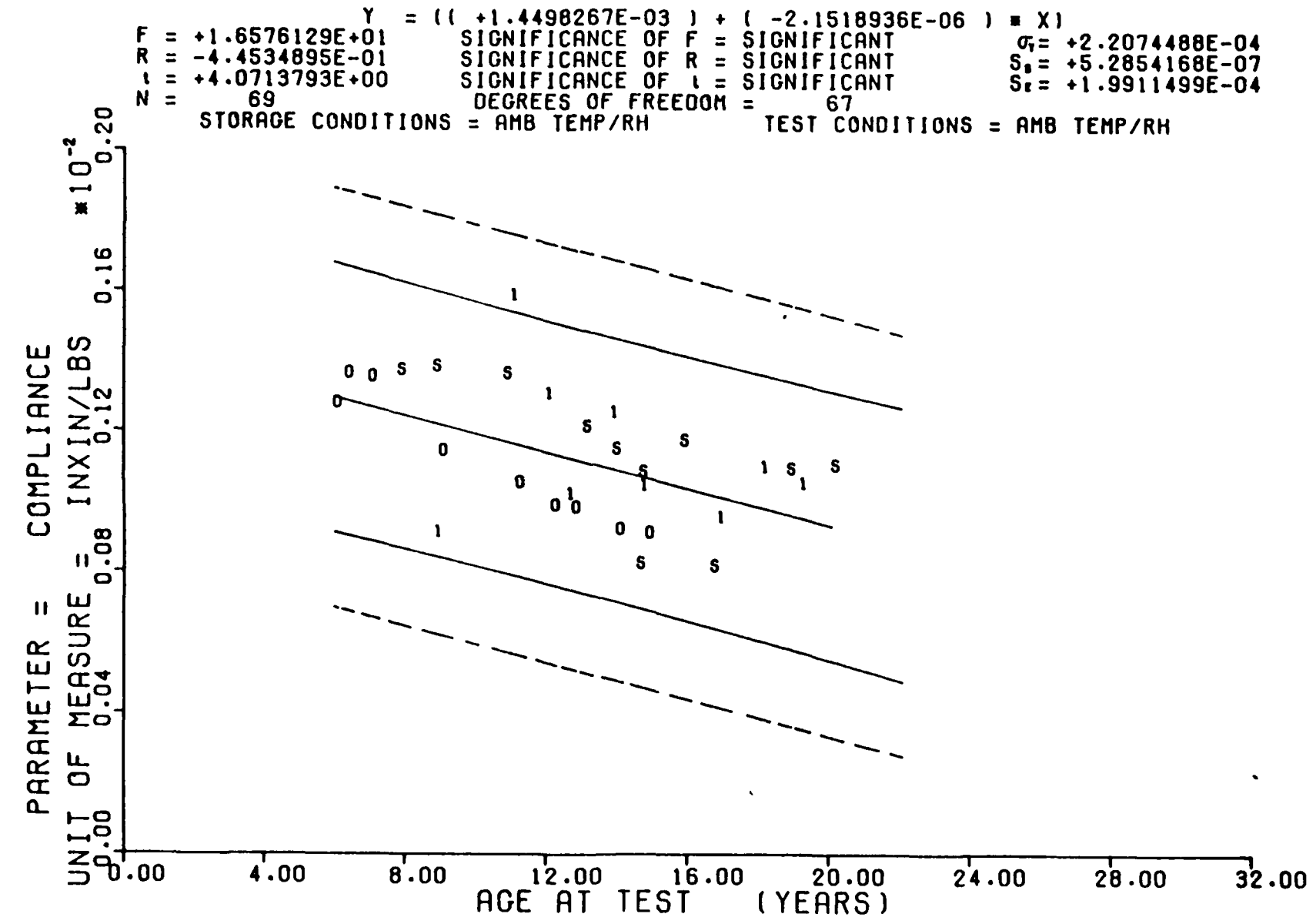
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	1	+7.8999996E-04	+0.0000000E+07	+7.8999996E-04	+7.8999996E-04	+1.1333900E-03
132.0	2	+1.4449998E-03	+7.7784788E-05	+1.4999997E-03	+1.3899998E-03	+1.0860124E-03
144.0	2	+1.1549997E-03	+6.3638460E-05	+1.1999998E-03	+1.1099998E-03	+1.0641459E-03
151.0	4	+9.1499974E-04	+1.4387380E-04	+1.1299999E-03	+8.2999980E-04	+1.0513905E-03
166.0	3	+1.1099998E-03	+1.0816609E-04	+1.1999998E-03	+9.8999985E-04	+1.0240571E-03
176.0	3	+9.4333314E-04	+9.8658726E-05	+1.0099997E-03	+8.2999980E-04	+1.0058351E-03
202.0	3	+8.4999972E-04	+3.6052453E-05	+8.7999994E-04	+8.0999988E-04	+9.5845758E-04
217.0	3	+9.9333305E-04	+1.2701651E-04	+1.1399998E-03	+9.1999978E-04	+9.3112420E-04
230.0	3	+9.2666642E-04	+1.7039168E-04	+1.0899999E-03	+7.4999989E-04	+9.0743554E-04

STAGE 1.DISCTED MOTOR=0012099.CREEP 10 LB LOAD.COMPLIANCE AT 10 SEC.



STAGE 1.DISCTED MOTOR=0012199.CREEP 10 LB LOAD.COMPLIANCE AT 20 SEC.

Figure 22



DISSECTED MOTOR TP-H1011,CREEP 10 LB LOAD,COMPLIANCE AT 20 SEC.

Figure 22A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	1	+8.9999986E-04	+0.0000000E+07	+8.9999986E-04	+8.9999986E-04	+1.2546330E-03
132.0	2	+1.5749998E-03	+7.7779895E-05	+1.6299998E-03	+1.5199999E-03	+1.2023379E-03
144.0	2	+1.2949998E-03	+7.7780806E-05	+1.3499998E-03	+1.2399998E-03	+1.1782017E-03
151.0	4	+1.0099997E-03	+1.5534918E-04	+1.2399998E-03	+8.9999986E-04	+1.1641222E-03
166.0	3	+1.2399998E-03	+1.0148818E-04	+1.3299998E-03	+1.1299999E-03	+1.1339520E-03
176.0	3	+1.0333331E-03	+9.8148814E-05	+1.0899999E-03	+9.1999978E-04	+1.1138385E-03
202.0	3	+9.4333314E-04	+4.5089774E-05	+9.8999985E-04	+8.9999986E-04	+1.0615431E-03
217.0	3	+1.0866664E-03	+1.3278991E-04	+1.2399998E-03	+1.0099997E-03	+1.0313729E-03
230.0	3	+1.0399997E-03	+2.0518266E-04	+1.2399998E-03	+8.2999980E-04	+1.0052253E-03

STAGE 1,DISCTED MOTOR=0012199,CREEP 10 LB LOAD,COMPLIANCE AT 20 SEC.

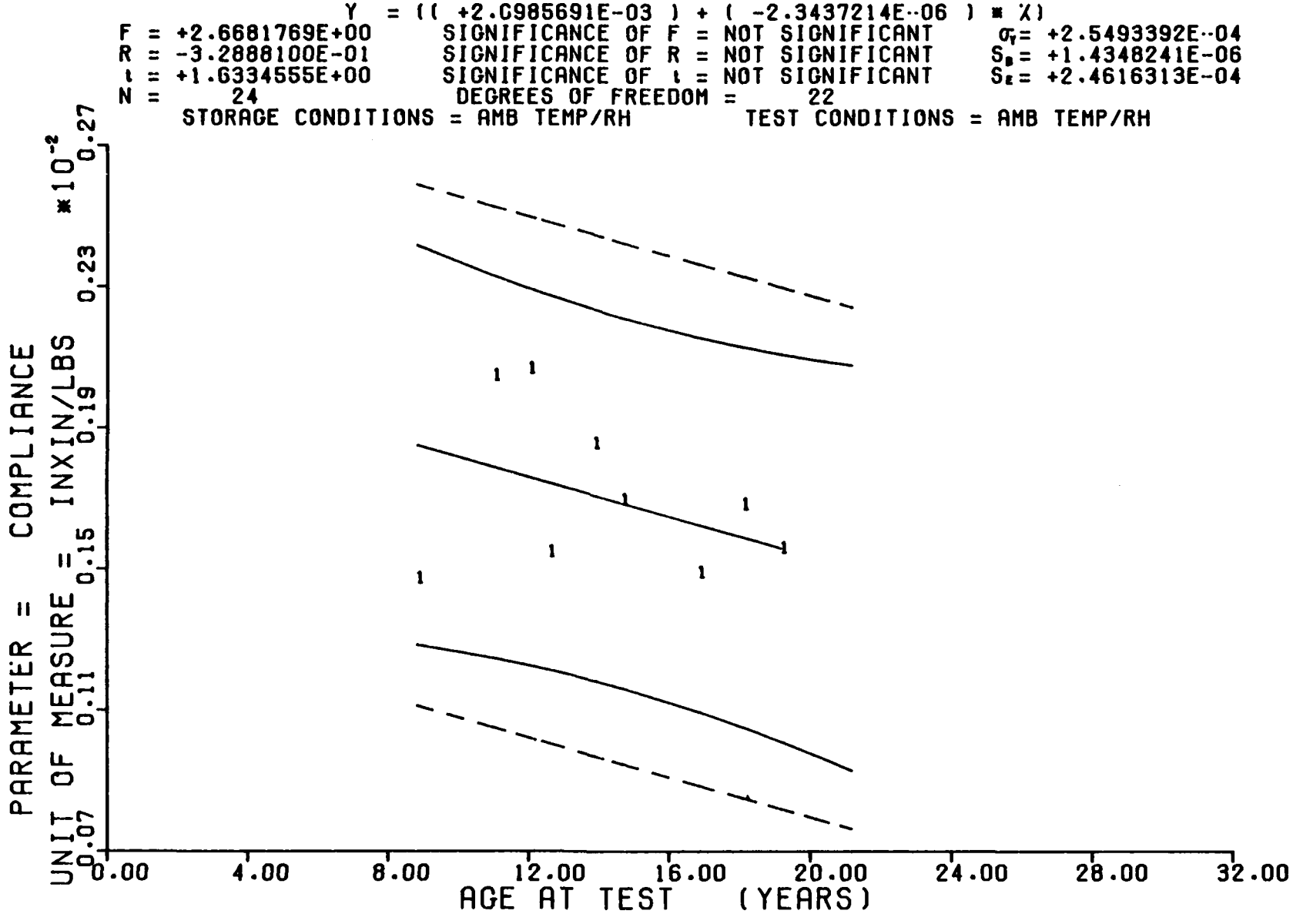
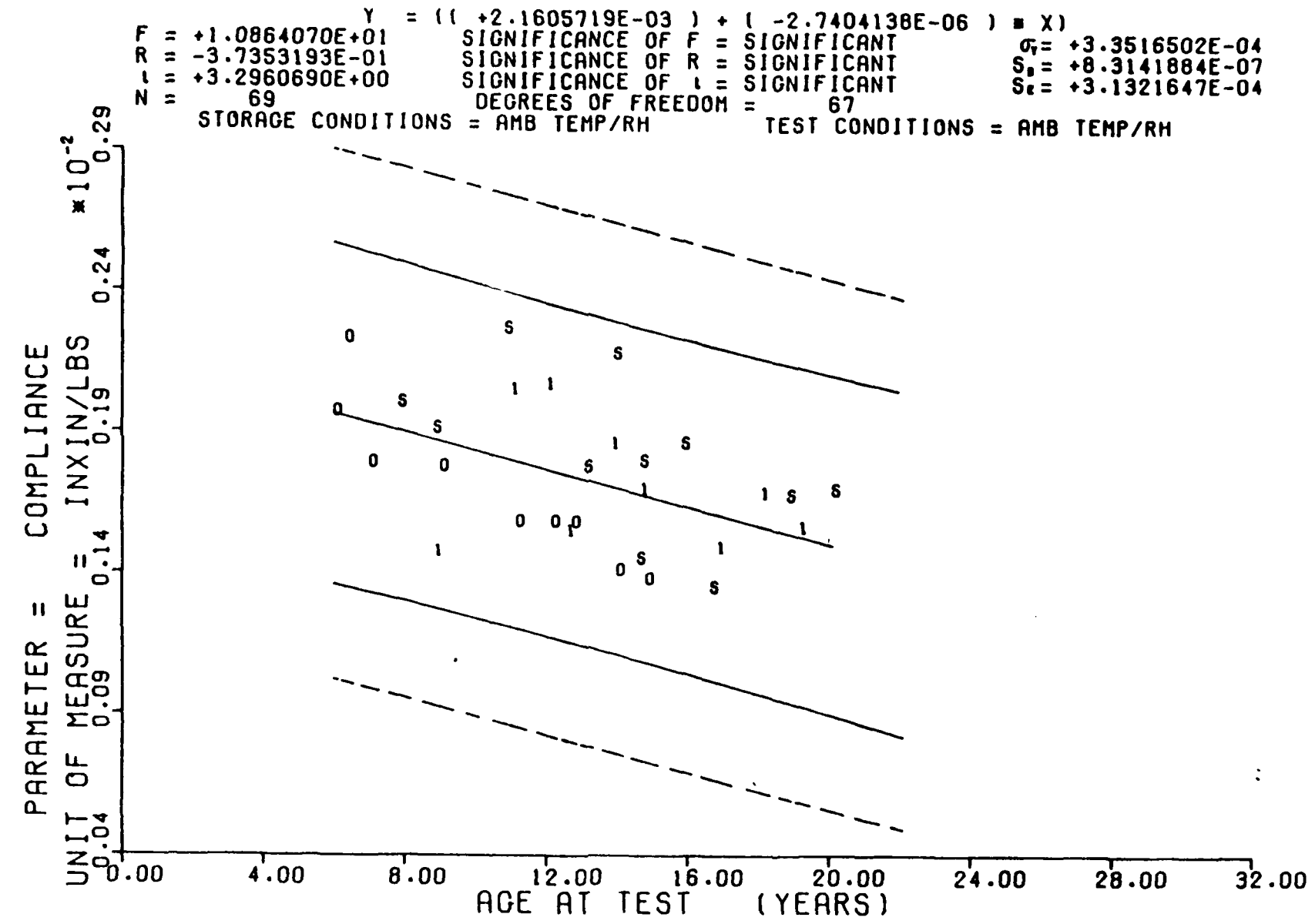

Y = ((+2.0985691E-03) + (-2.3437214E-06) * X)
F = +2.6681769E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +2.5493392E-04
R = -3.2888100E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT SB = +1.4348241E-06
t = +1.6334555E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT SE = +2.4616313E-04
N = 24 DEGREES OF FREEDOM = 22
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COMPLIANCE
UNIT OF MEASURE = INXIN/LBS *10-2
0.27
0.23
0.19
0.15
0.11
0.07
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.CREEP 10 LB LOAD.COMPLIANCE AT 1000 SEC.

Figure 23



DISSECTED MOTOR TP-H1011.CREEP 10 LB LOAD.COMPLIANCE AT 1000 SEC.

Figure 23A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

[illegible] (SECONDS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
1[illegible].0	1	+1.4599999E-03	+0.0000000E+07	+1.4599999E-03	+1.4599999E-03	+1.8501346E-03
1[illegible].0	2	+2.0349994E-03	+2.4747459E-04	+2.2099998E-03	+1.8599999E-03	+1.7891977E-03
1[illegible].0	3	+2.0549986E-03	+1.4852542E-04	+2.1599999E-03	+1.9499999E-03	+1.7610732E-03
1[illegible].0	4	+1.9349984E-03	+2.0331353E-04	+1.9299997E-03	+1.3899998E-03	+1.7446670E-03
1[illegible].0	5	+1.8433332E-03	+1.7473684E-04	+1.9399997E-03	+1.6499999E-03	+1.7095112E-03
1[illegible].0	6	+1.8833320E-03	+1.1804434E-05	+1.8899998E-03	+1.8699998E-03	+1.6860740E-03
[illegible].0	8	+1.4766664E-03	+7.5052814E-05	+1.5199999E-03	+1.3899998E-03	+1.6251374E-03
2[illegible].0	3	+1.8699992E-03	+1.9999838E-04	+1.8599999E-03	+1.4799998E-03	+1.5899816E-03
[illegible].0	3	+1.9466660E-03	+2.6020022E-04	+1.7999999E-03	+1.2799999E-03	+1.5595131E-03

1 STAGE 1,FISCHER MOTOR=0012199,CREEP 10 LB LOAD,COMPLIANCE AT 1000 SEC.

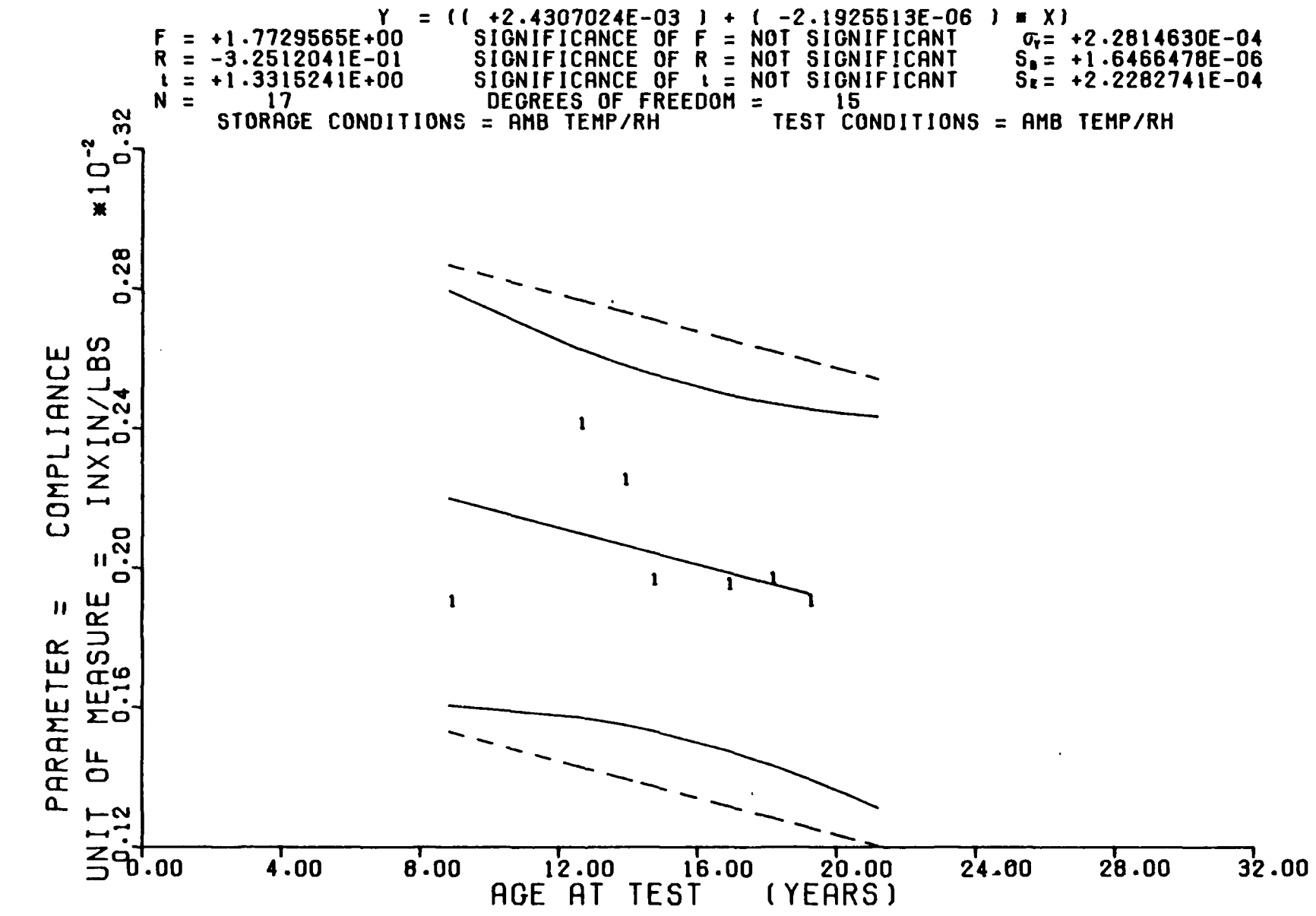

Y = ((+2.4307024E-03) + (-2.1925513E-06) * X)
F = +1.7729565E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY = +2.2814630E-04
R = -3.2512041E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT SB = +1.6466478E-06
t = +1.3315241E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT SE = +2.2282741E-04
N = 17 DEGREES OF FREEDOM = 15
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COMPLIANCE
UNIT OF MEASURE = INXIN/LBS *10-2
0.32
0.28
0.24
0.20
0.16
0.12
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.CREEP 10 LB LOAD.COMPLIANCE AT 10.000 SEC.

Figure 24

Y = ((+2.9601604E-03) + (-4.7487540E-06) * X)

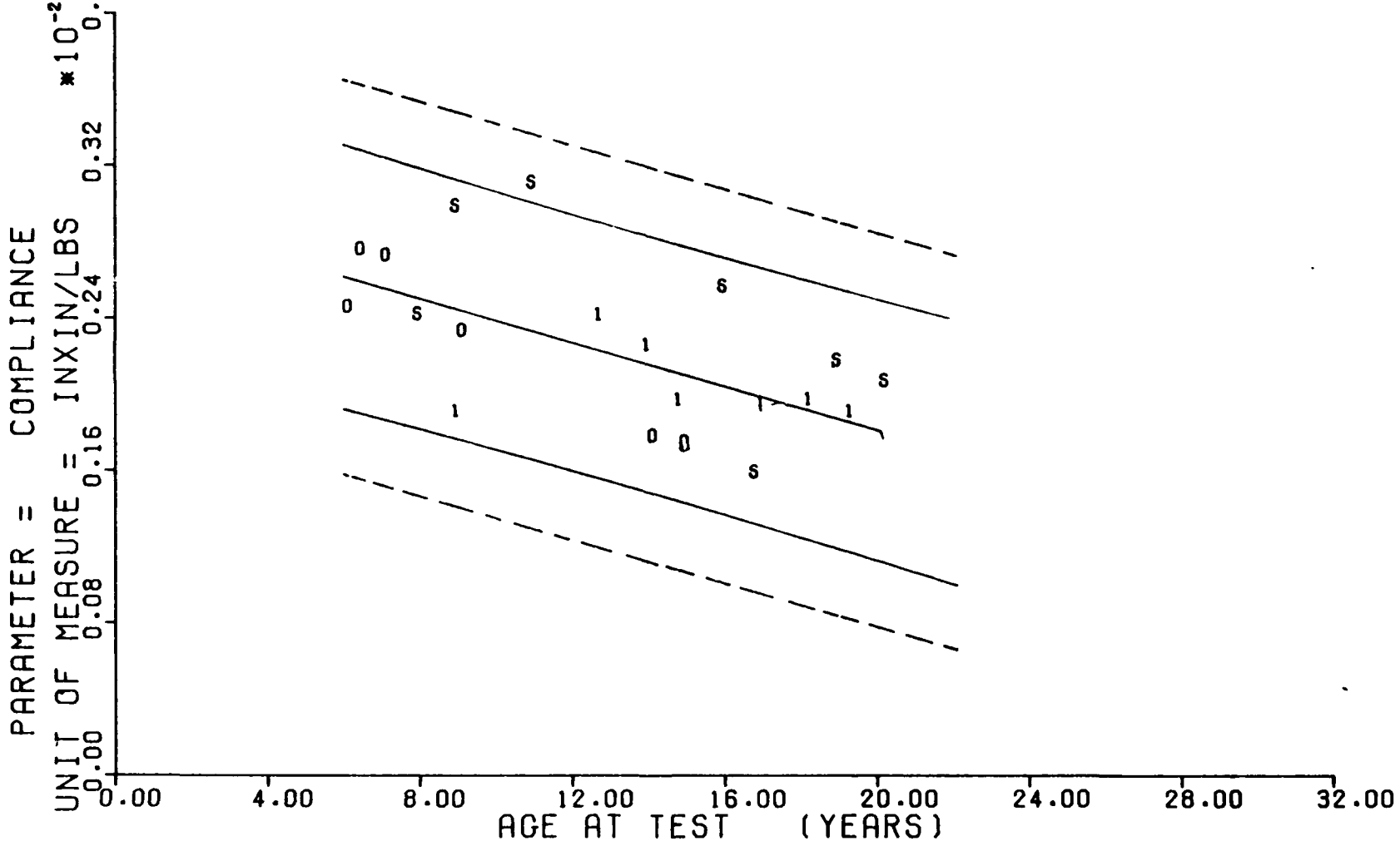
F = +2.5562003E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_T = +4.2815537E-04

R = -6.0188288E-01 SIGNIFICANCE OF R = SIGNIFICANT S_β = +9.3925222E-07

t = +5.0558879E+00 SIGNIFICANCE OF t = SIGNIFICANT S_ε = +3.4569640E-04

N = 47 DEGREES OF FREEDOM = 45

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



DISSECTED MOTOR TP-H1011,CREEP 10 LB LOAD,COMPLIANCE AT 10,000 SEC.

Figure 24A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

[illegible]	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
[illegible]	1	+1.3[illegible]9999E-03	+0.0000000E+07	+1.3899999E-03	+1.3399999E-03	+2.1082910E-03
1 1.0	1	+2.3999998E-03	+0.0000000E+07	+2.3999999E-03	+2.3999998E-03	+2.099[illegible]2691E-03
[illegible]	3	+2.2399984E-03	+2.1933842E-04	+2.3999998E-03	+1.9899997E-03	+2.0667336E-03
[illegible]	[illegible]	+1.[illegible]333322E-03	+1.[illegible]330395E-04	+2.0299998E-03	+1.7999999E-03	+2.0448132E-03
[illegible]	3	+1.8599994E-03	+[illegible].3402562E-05	+2.0299998E-03	+1.8399998E-03	+1.9872069E-03
[illegible]	[illegible]	+1.[illegible]666511E-03	+[illegible].2145136E-04	+2.2099999E-03	+1.7999999E-03	+1.9549187E-03
[illegible]	[illegible]	+1.9333326E-03	+[illegible].0534441E-04	+2.1899999E-03	+1.5799999E-03	+1.9264153E-03

[illegible] 1.SELECTED MOTOR=001219[illegible],GROUP 10 LB LOAD,COMPLIANCE AT 10,000 SEC.

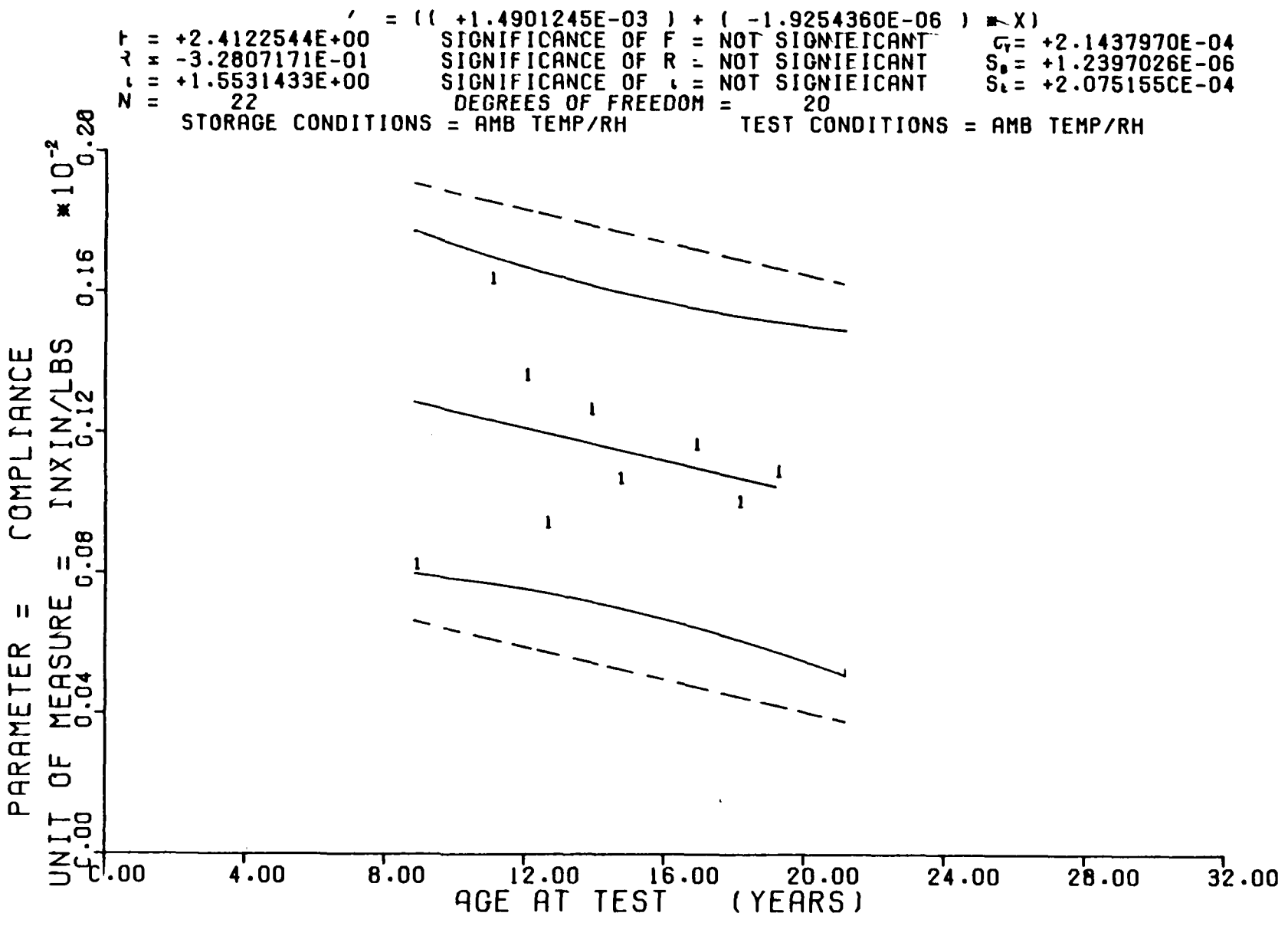
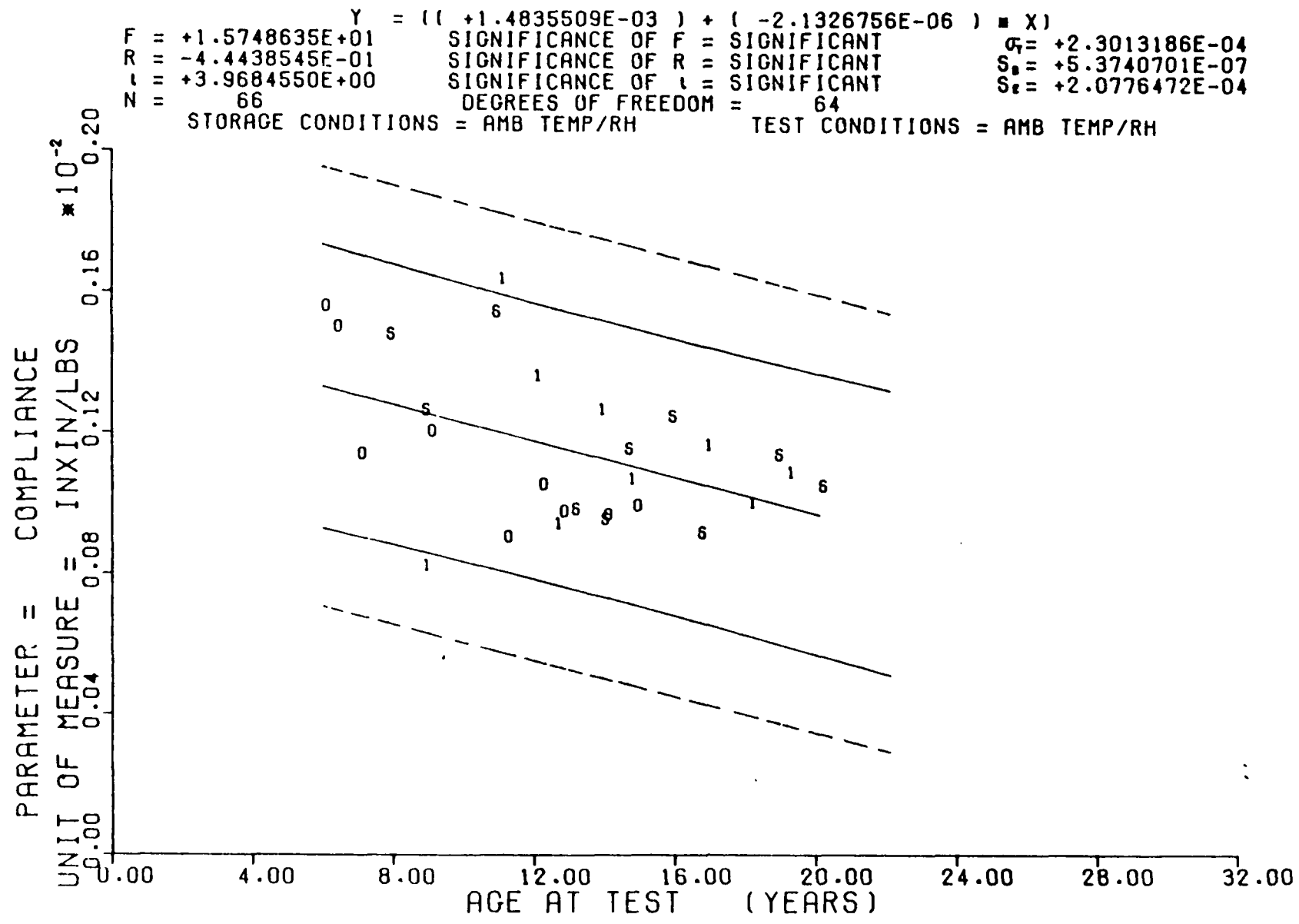

= ((+1.4901245E-03) + (-1.9254360E-06) * X)
r = +2.4122544E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY= +2.1437970E-04
r = -3.2807171E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sβ = +1.2397026E-06
t = +1.5531433E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT St = +2.075155CE-04
N = 22 DEGREES OF FREEDOM = 20
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COMPLIANCE
UNIT OF MEASURE = INXIN/LBS *10-2
0.00
0.04
0.08
0.12
0.16
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.CREEP 12 LB LOAD.COMPLIANCE AT 10 SEC.

Figure 25

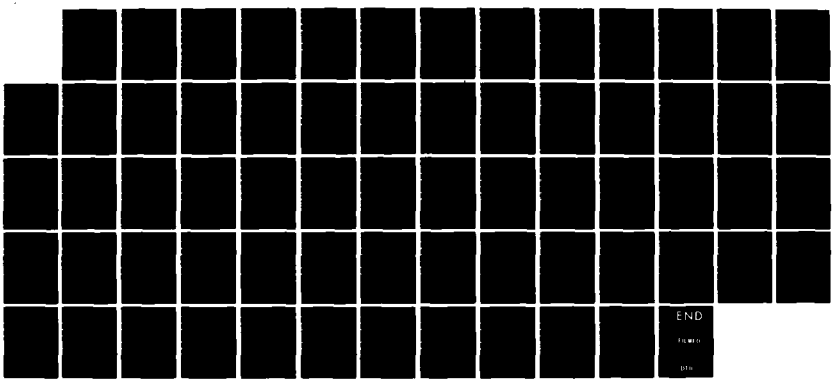


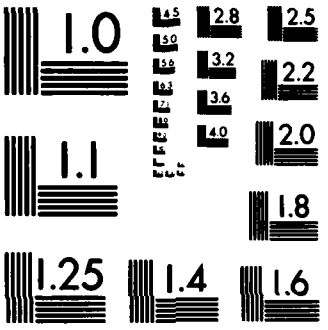
DISSECTED MOTOR TP-H1011,CREEP 12 LB LOAD,COMPLIANCE AT 10 SEC.

Figure 25A

AD-A153 206 SURVEILLANCE REPORT STAGE I DISSECTED MOTORS/ PROPELLANTS MOTOR NUMBER 00.. (U) OGDEN AIR LOGISTICS CENTER HILL AFB UT PROPELLANT ANALYSIS LA.. 2/2

UNCLASSIFIED J A THOMPSON MAR 85 MANPA-503(85) F/G 21/8.2 NL





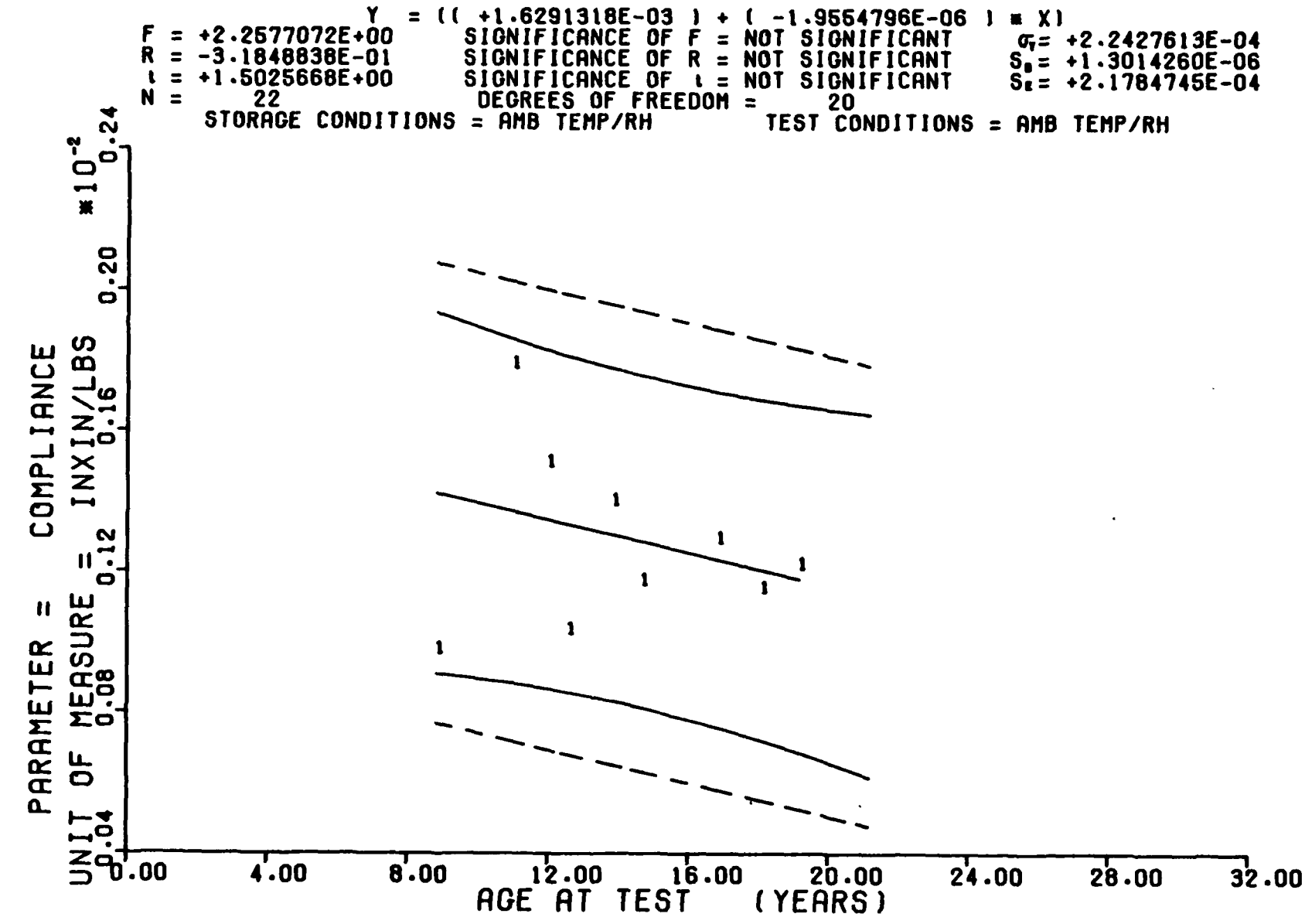
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963-A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	1	+8.0999988E-04	+0.0000000E+07	+8.0999988E-04	+8.0999988E-04	+1.2860281E-03
132.0	2	+1.6249998E-03	+4.9497517E-05	+1.6599998E-03	+1.5899999E-03	+1.2359668E-03
144.0	2	+1.3499998E-03	+1.8384802E-04	+1.4799998E-03	+1.2199999E-03	+1.2128616E-03
151.0	2	+9.2999986E-04	+7.0702867E-05	+9.7999977E-04	+8.7999994E-04	+1.1993835E-03
166.0	3	+1.2533331E-03	+9.2373851E-05	+1.3599998E-03	+1.1999998E-03	+1.1705020E-03
176.0	3	+1.0566664E-03	+2.5158932E-05	+1.0799998E-03	+1.0299999E-03	+1.1512476E-03
202.0	3	+1.1533331E-03	+3.2141070E-05	+1.1899999E-03	+1.1299999E-03	+1.1011862E-03
217.0	3	+9.8999985E-04	+3.6050328E-05	+1.0199998E-03	+9.4999978E-04	+1.0723047E-03
230.0	3	+1.0766664E-03	+5.6859570E-05	+1.1399998E-03	+1.0299999E-03	+1.0472740E-03

STAGE 1.DISCTED MOTOR=0012199.CREEP 12 LB LOAD.COMPLIANCE AT 10 SEC.



STAGE 1.DISCTED MOTOR=0012199.CREEP 12 LB LOAD.COMPLIANCE AT 20 SEC.

Figure 26

Y = ((+1.7293819E-03) + (-2.7111158E-06) ∗ X)

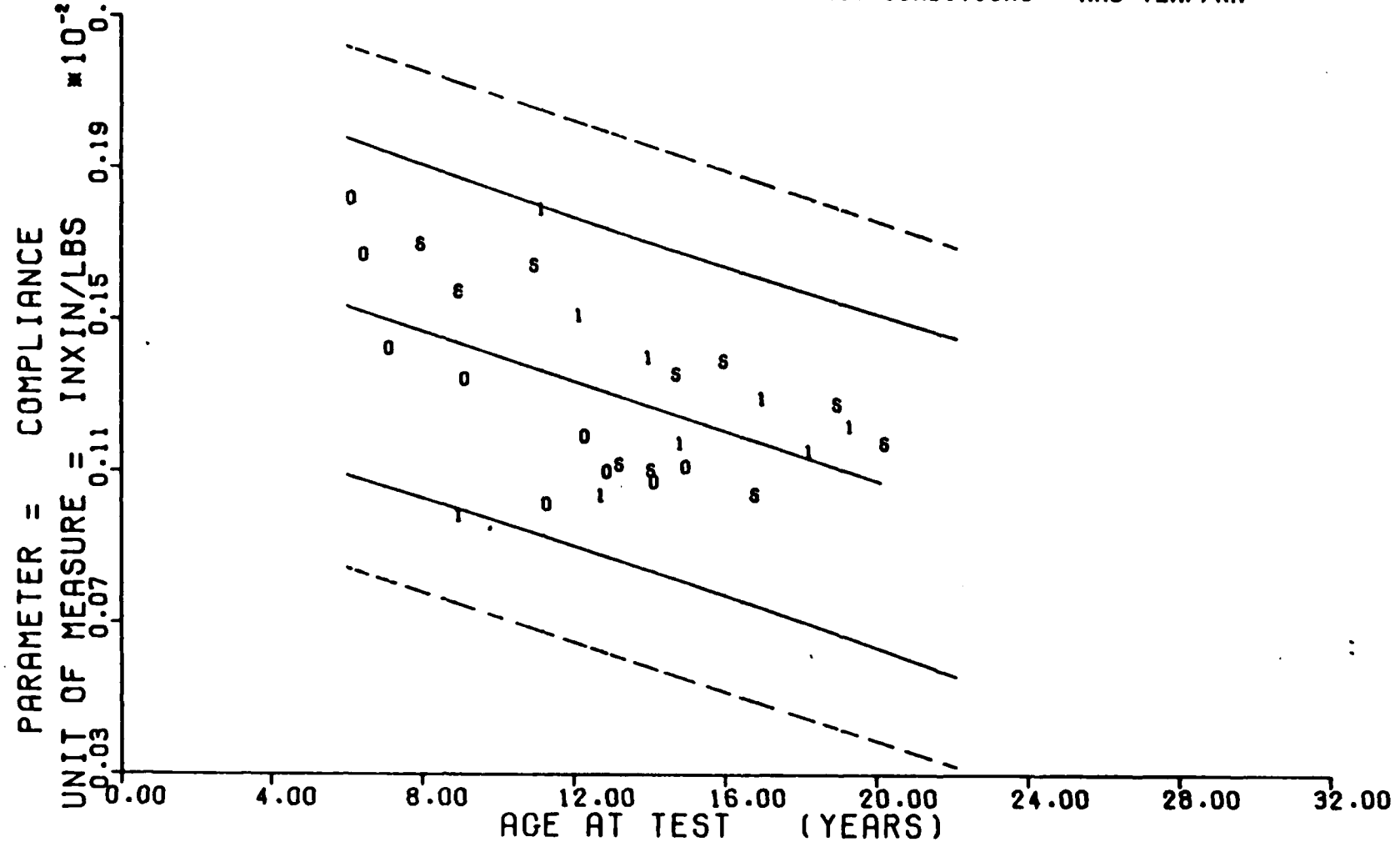
F = +2.0890509E+01 SIGNIFICANCE OF F = SIGNIFICANT σ_Y = +2.6206855E-04

R = -4.9607226E-01 SIGNIFICANCE OF R = SIGNIFICANT S_b = +5.9316231E-07

t = +4.5706137E+00 SIGNIFICANCE OF t = SIGNIFICANT S_ε = +2.2932005E-04

N = 66 DEGREES OF FREEDOM = 64

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



DISSECTED MOTOR TP-H1011.CREEP 12 LB LOAD.COMPLIANCE AT 20 SEC.

Figure 26A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

Area (sq. cm.)	Specimens per group	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
100.0	1	+9.6999993E-04	+0.0000000E+07	+9.6999993E-04	+9.6999993E-04	+1.4218508E-03
133.0	2	+1.7799999E-03	+4.2437450E-05	+1.8099998E-03	+1.7499998E-03	+1.3710083E-03
144.0	2	+1.4999997E-03	+1.9793875E-04	+1.6399999E-03	+1.3599998E-03	+1.3475427E-03
151.0	2	+1.0249998E-05	+7.7779695E-05	+1.0799998E-03	+9.6999993E-04	+1.3338543E-03
100.0	3	+1.3899989E-03	+9.5416171E-05	+1.4999997E-03	+1.3299998E-03	+1.3045221E-03
170.0	3	+1.1633331E-03	+3.0544797E-05	+1.1999999E-03	+1.1299999E-03	+1.2849674E-03
200.0	3	+1.2833331E-03	+1.5250013E-05	+1.2999998E-03	+1.2699998E-03	+1.2341248E-03
217.0	3	+1.1433332E-03	+7.0944756E-05	+1.2199999E-03	+1.0799998E-03	+1.2047926E-03
250.0	3	+1.2099999E-03	+6.2442926E-05	+1.2799999E-03	+1.1599999E-03	+1.1793714E-03

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STAGE 1,DISCIPLINE=0121 99,CREEP 12 LB LOAD,COMPLIANCE AT 20 SEC.

Y = ((+2.5311123E-03) + (-2.8564638E-06) * X)

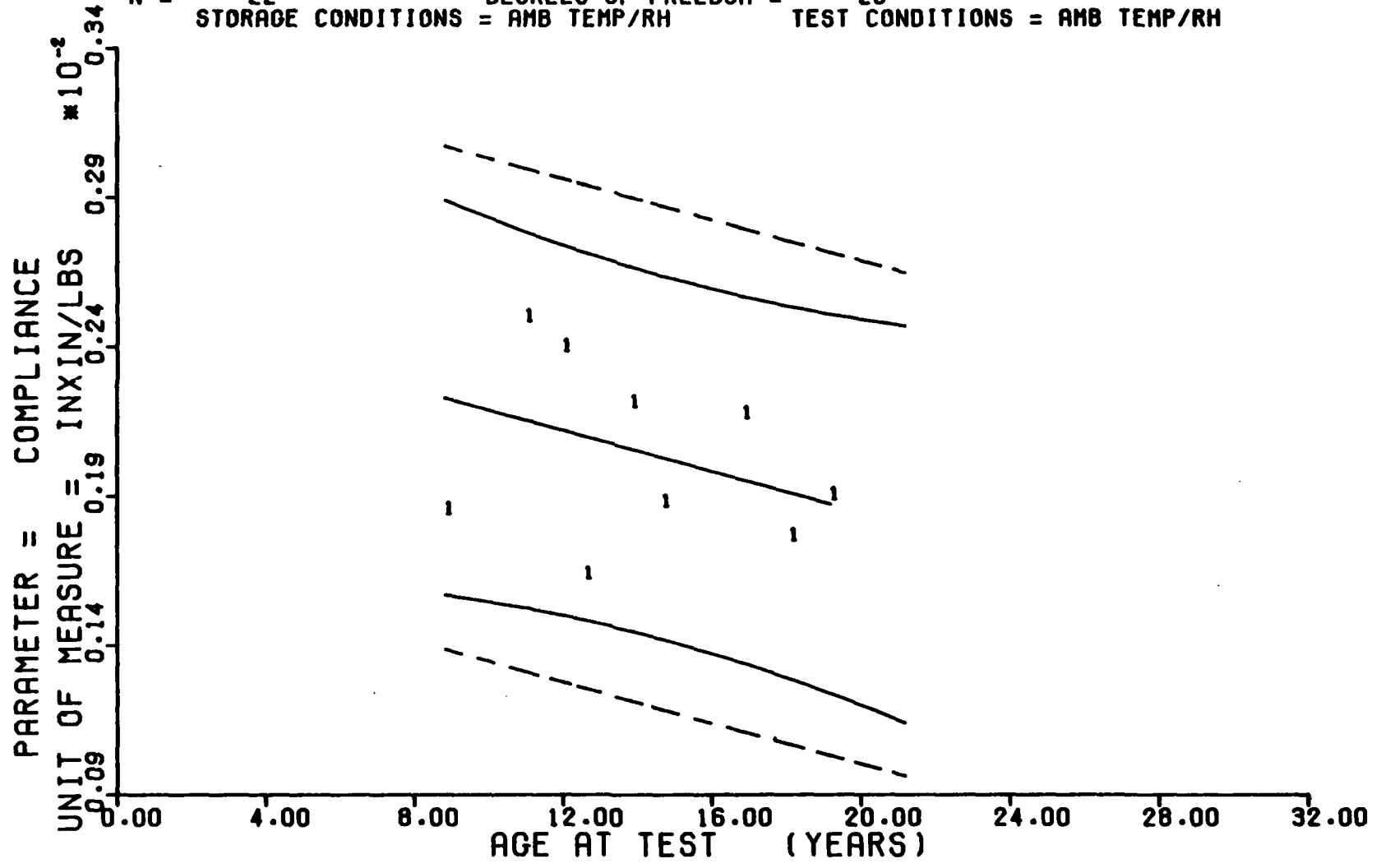
F = +2.9019374E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_r = +2.9311914E-04

R = -3.5596550E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT S_θ = +1.6768132E-06

t = +1.7035073E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT S_z = +2.8068403E-04

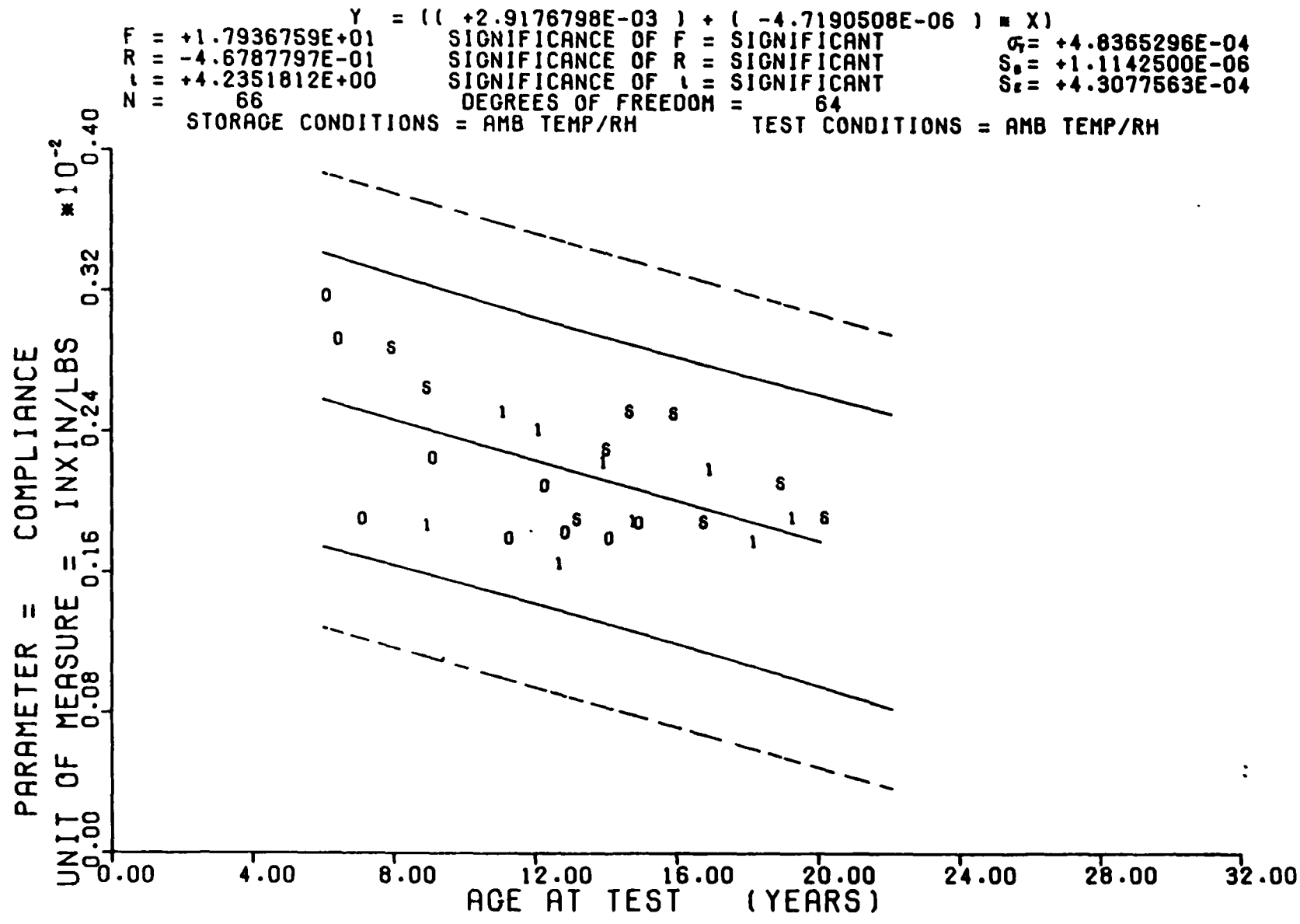
N = 22 DEGREES OF FREEDOM = 20

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



STAGE 1,DISCTED MOTOR=0012199,CREEP 12 LB LOAD,COMPLIANCE AT 1000 SEC.

Figure 27



DISSECTED MOTOR TP-H1011.CREEP 12 LB LOAD.COMPLIANCE AT 1000 SEC.

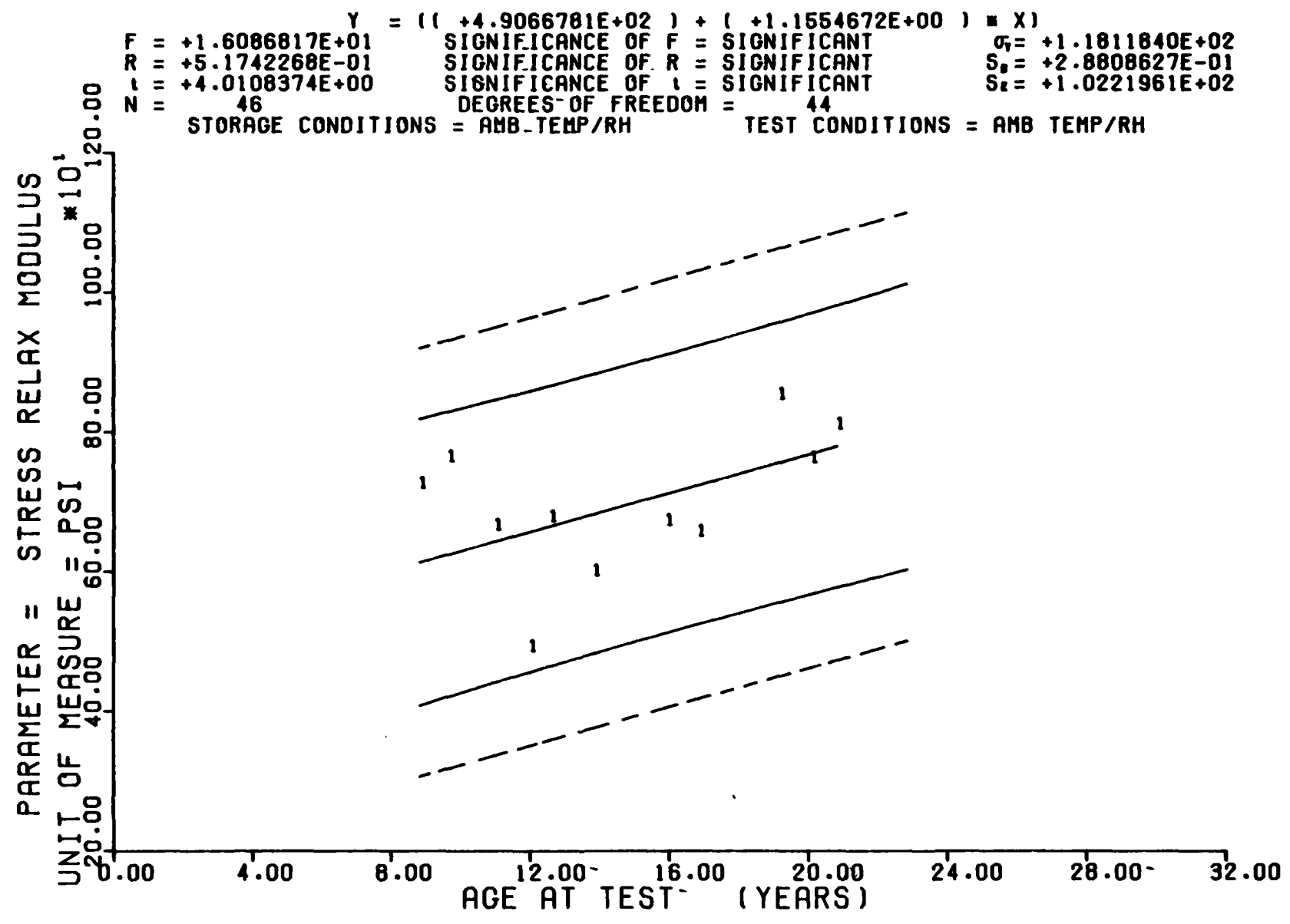
Figure 27A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

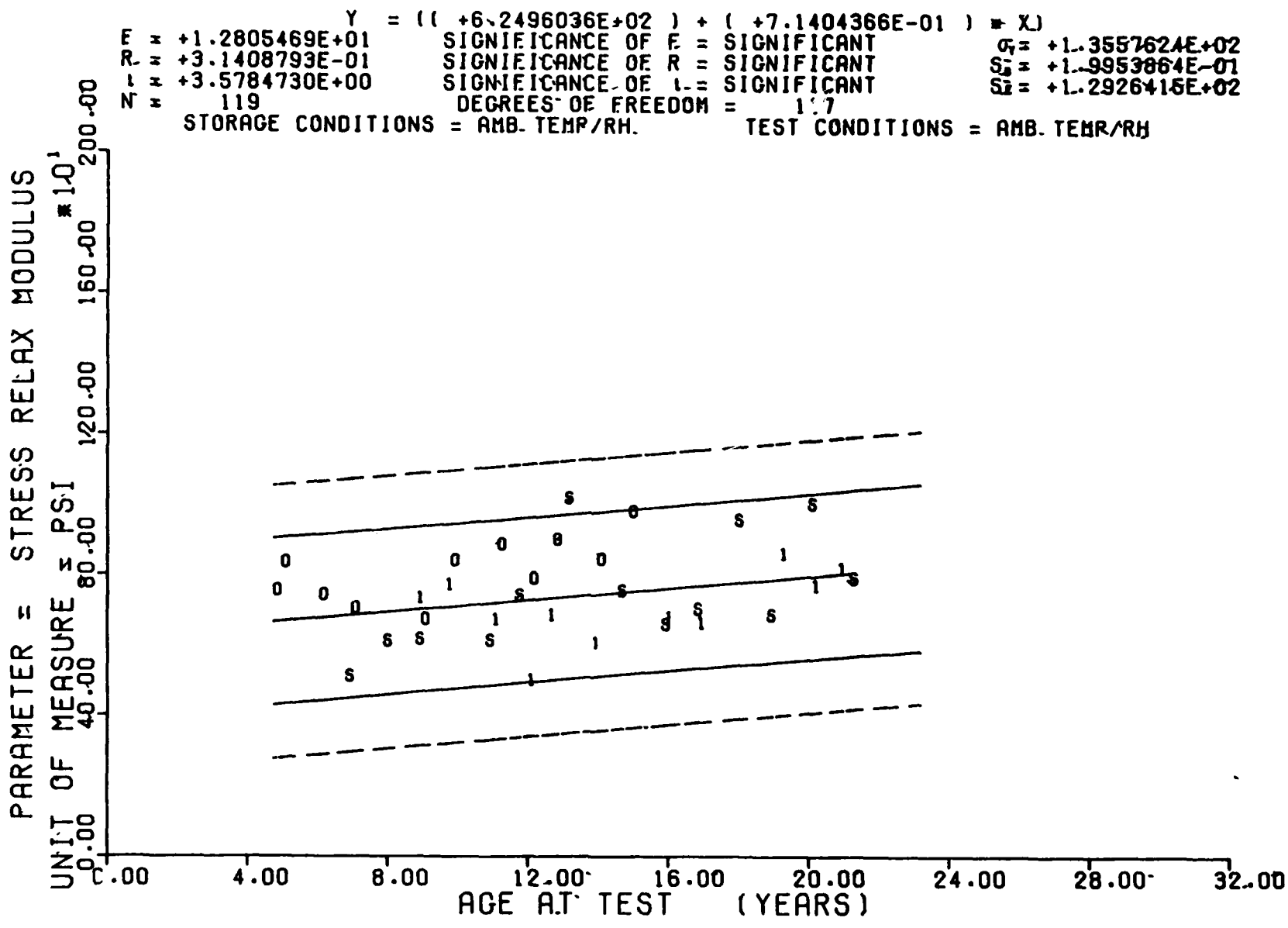
AGE (CENTIS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
1X.0	1	+1.8399998E-03	+0.0000000E+07	+1.8399998E-03	+1.8399998E-03	+2.2283270E-03
1..0	2	+2.4849995E-03	+2.0183550E-04	+2.6999998E-03	+2.2999998E-03	+2.1540590E-03
1..0	3	+2.3849997E-03	+2.7577410E-04	+2.5799998E-03	+2.1899999E-03	+2.1197814E-03
1.1.0	2	+1.6249998E-03	+1.3415182E-04	+1.7199998E-03	+1.5299997E-03	+2.0997861E-03
1..0	3	+2.1999985E-03	+1.3995096E-04	+2.3599998E-03	+2.1099997E-03	+2.0569392E-03
17.0	3	+1.8666659E-03	+8.3882464E-05	+1.9199999E-03	+1.7699999E-03	+2.0283746E-03
..0	3	+2.1633319E-03	+2.5325602E-05	+2.1899999E-03	+2.1399999E-03	+1.9541066E-03
217.0	3	+1.7933325E-03	+5.6833788E-05	+1.7999999E-03	+1.6899998E-03	+1.9112597E-03
..0.0	3	+1.8899985E-03	+1.4935370E-04	+2.0599998E-03	+1.7799998E-03	+1.8741255E-03

STAGE 1,DISCED MOTOR=0012199,CREEP 12 LB LOAD,COMPLIANCE AT 1000 SEC.



STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.3 % STRAIN AT 10 SEC.

Figure 28



TP-H1011 DISSECTED MTRS, STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 10 SEC

Figure 28A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+7.2000000E+02	+5.1961524E+01	+7.5000000E+02	+6.6000000E+02	+6.1314721E+02
116.0	3	+7.5866650E+02	+1.5044378E+01	+7.7300000E+02	+7.4300000E+02	+6.2470190E+02
132.0	3	+6.6000000E+02	+1.6999999E+01	+6.7700000E+02	+6.4300000E+02	+6.4318945E+02
144.0	4	+4.8650000E+02	+3.7278233E+01	+5.2000000E+02	+4.4000000E+02	+6.5705493E+02
151.0	3	+6.7233325E+02	+3.2331615E+01	+7.0700000E+02	+6.4300000E+02	+6.6514331E+02
166.0	3	+5.9433325E+02	+3.5571524E+01	+6.3300000E+02	+5.6300000E+02	+6.8247534E+02
191.0	3	+6.6700000E+02	+2.6457513E+01	+6.9700000E+02	+6.4700000E+02	+7.1136206E+02
202.0	3	+6.5100000E+02	+7.2111025E+00	+6.5700000E+02	+6.4300000E+02	+7.2407202E+02
230.0	3	+8.4766650E+02	+1.2858201E+01	+8.5700000E+02	+8.3300000E+02	+7.5642504E+02
241.0	6	+7.5666650E+02	+8.0955955E+01	+8.7300000E+02	+6.4300000E+02	+7.6913525E+02
250.0	12	+8.0500000E+02	+1.0683632E+02	+9.9000000E+02	+6.8300000E+02	+7.7953442E+02

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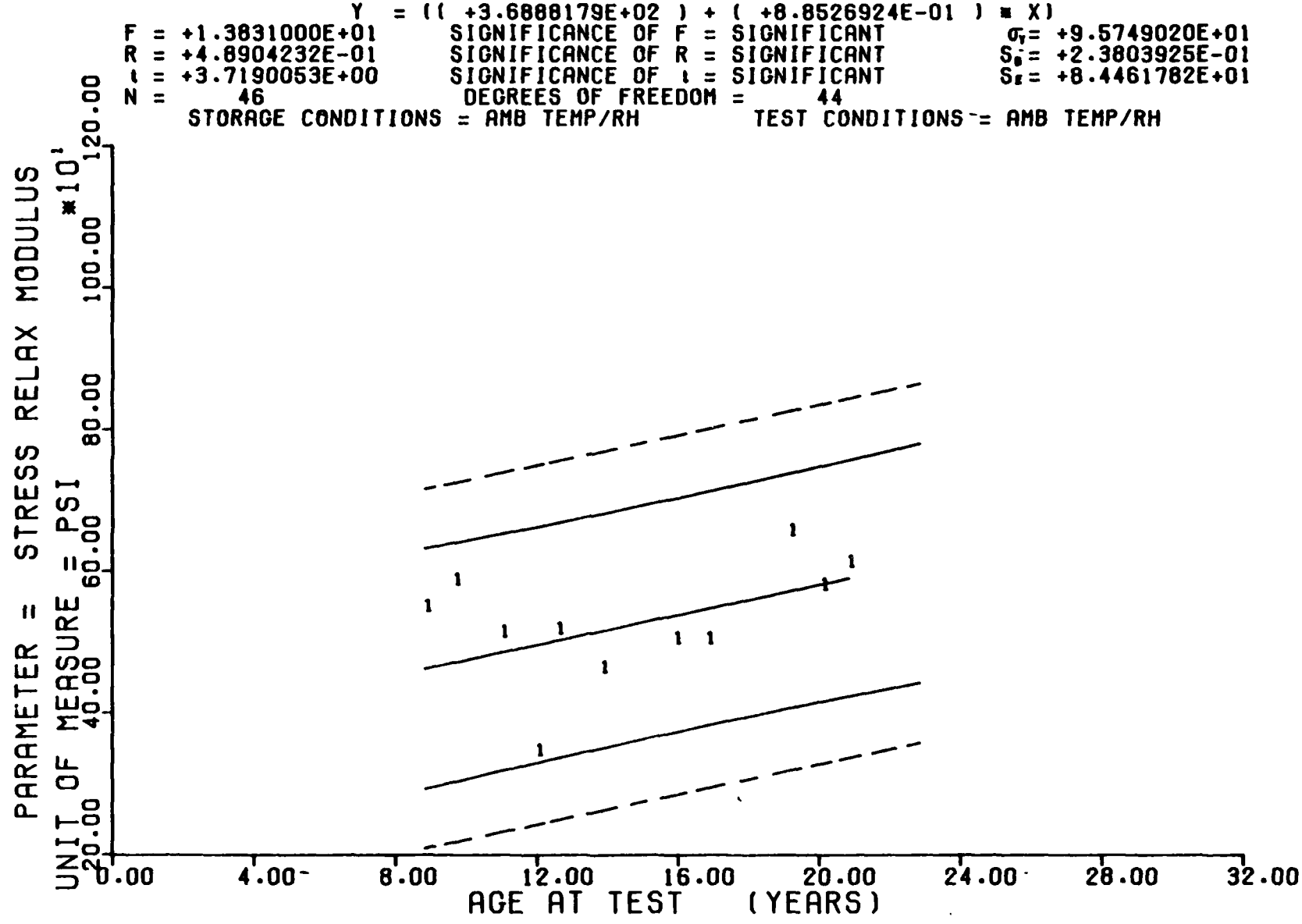
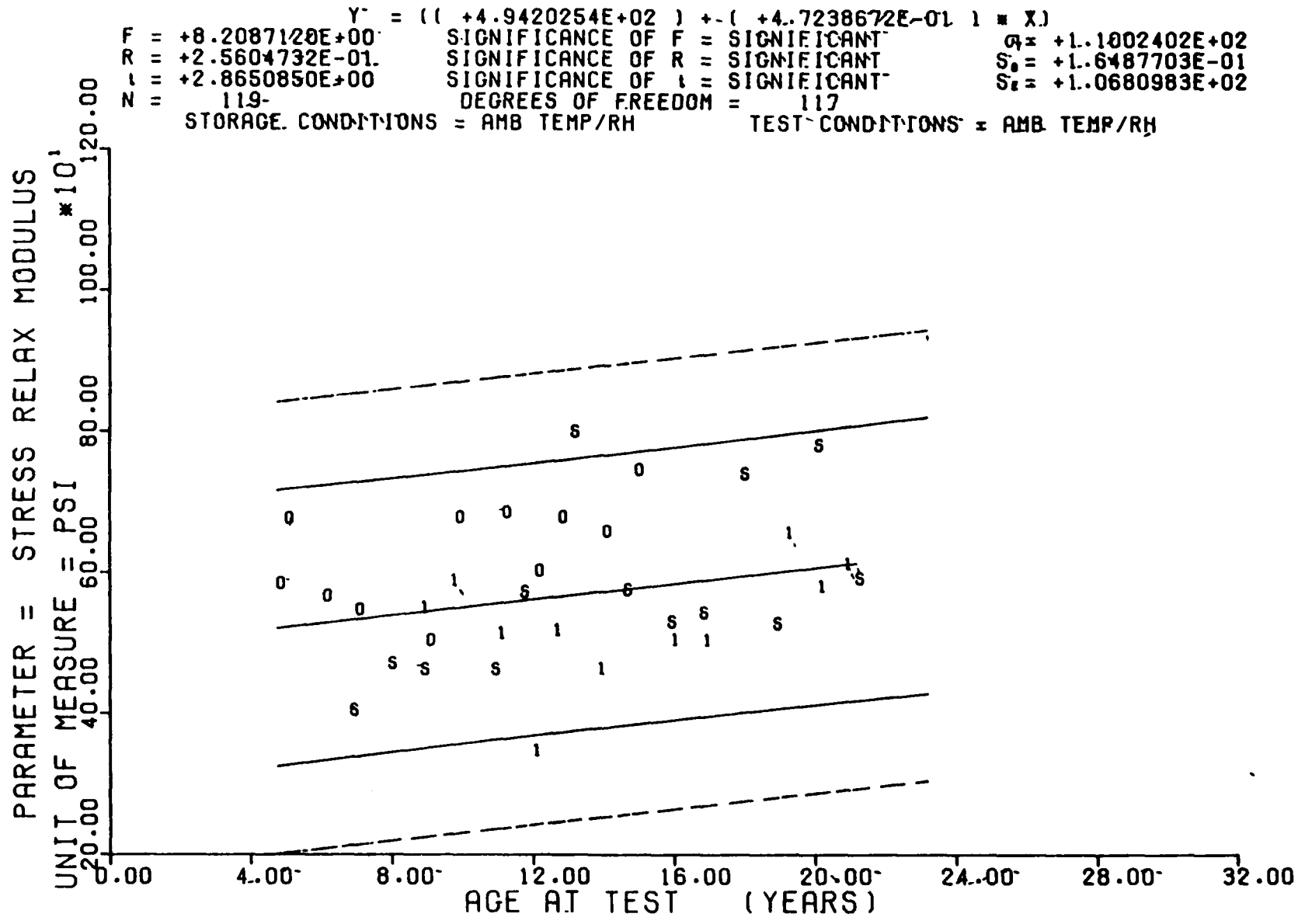
STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,3 % STRAIN AT 10 SEC.



STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,3 % STRAIN AT 50 SEC.

Figure 29



TP-H1011 DISSECTED MTRS. STRESS RELAXATION MODULUS. 3 PERCENT STRAIN. 50 SEC

Figure 29A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+5.4400000E+02	+3.8105117E+01	+5.6600000E+02	+5.0000000E+02	+4.6272021E+02
116.0	3	+5.8200000E+02	+2.0074859E+01	+6.0300000E+02	+5.6300000E+02	+4.7157299E+02
132.0	3	+5.0766650E+02	+1.5011106E+01	+5.2300000E+02	+4.9300000E+02	+4.8573730E+02
144.0	4	+3.4100000E+02	+1.8018509E+01	+3.6000000E+02	+3.1700000E+02	+4.9636035E+02
151.0	3	+5.1233325E+02	+2.6576932E+01	+5.4000000E+02	+4.8700000E+02	+5.0255737E+02
166.0	3	+4.5766650E+02	+2.7300793E+01	+4.8700000E+02	+4.3300000E+02	+5.1583642E+02
191.0	3	+4.9900000E+02	+2.0297783E+01	+5.1700000E+02	+4.7700000E+02	+5.3796801E+02
202.0	3	+4.9866650E+02	+5.1316014E+00	+5.0300000E+02	+4.9300000E+02	+5.4770605E+02
230.0	3	+6.5100000E+02	+1.8248287E+01	+6.6300000E+02	+6.3000000E+02	+5.7249365E+02
241.0	6	+5.7500000E+02	+7.0350550E+01	+6.7000000E+02	+4.8000000E+02	+5.8223144E+02
250.0	12	+6.0666650E+02	+8.5760059E+01	+7.6000000E+02	+5.0000000E+02	+5.9019897E+02

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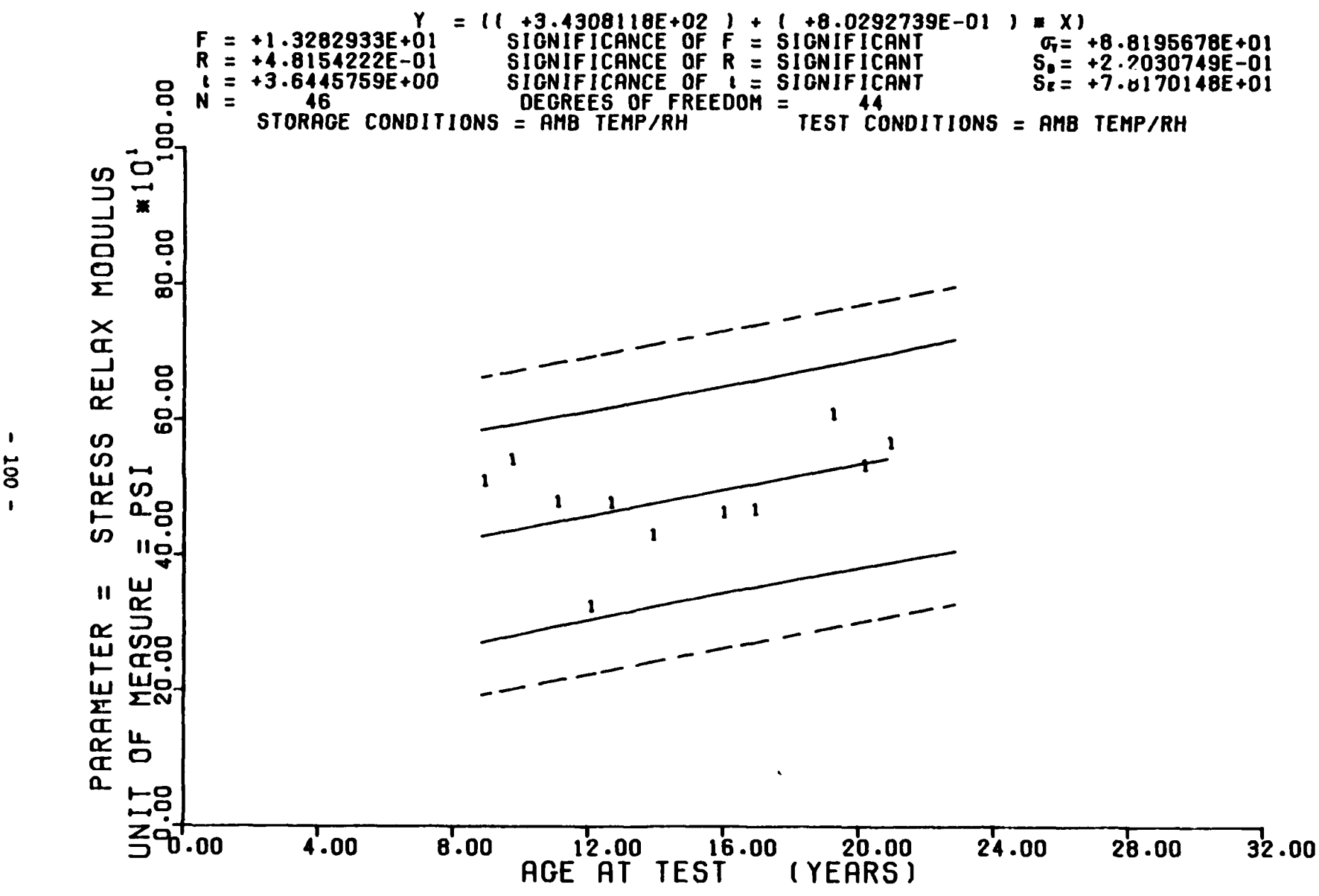
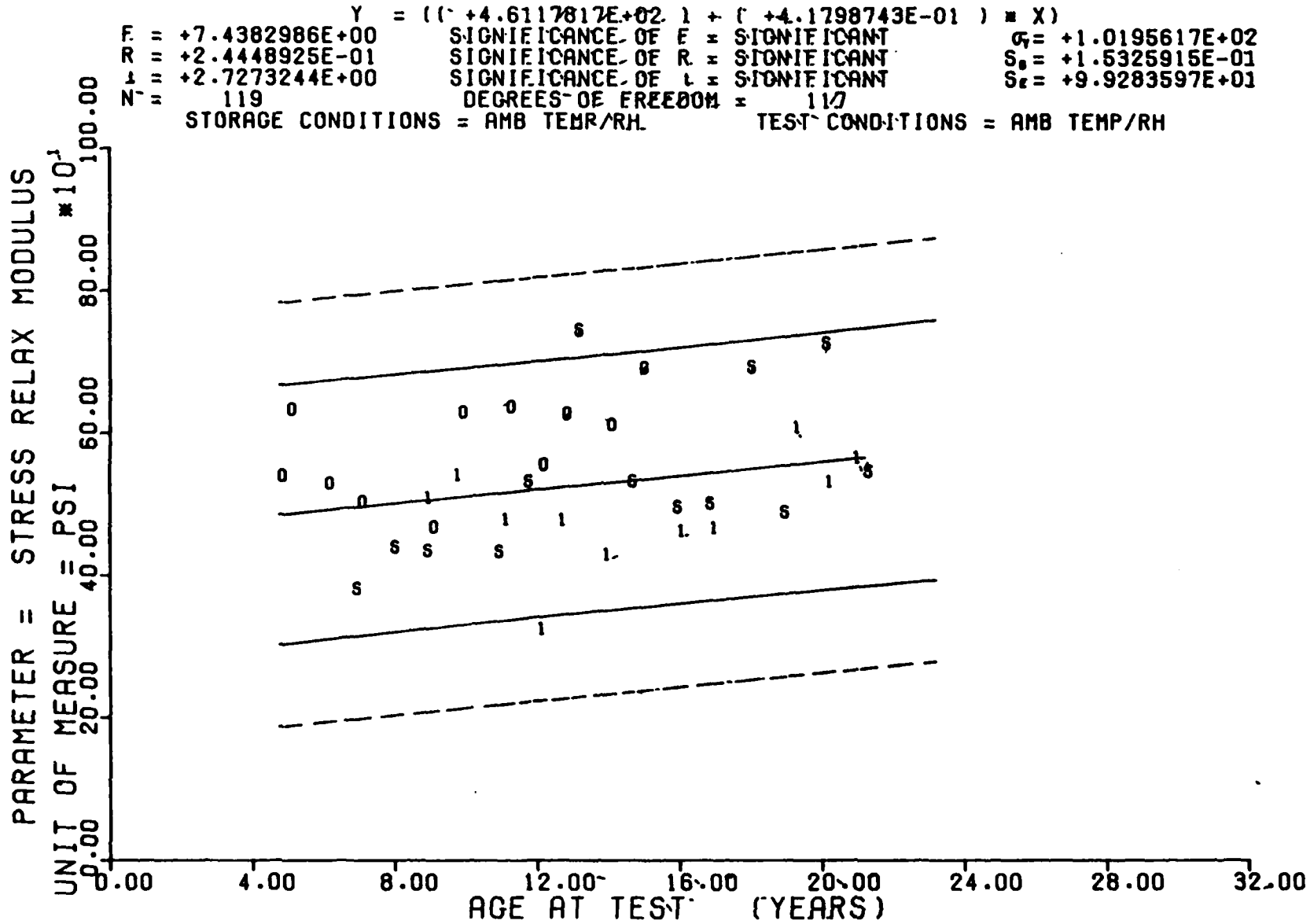
STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,3 % STRAIN AT 50 SEC.



STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.3 % STRAIN AT 100 SEC.

Figure 30



TP-H1011 DISSECTED MTRS, STRESS RELAXATION MODULUS, 3 PERCENT STRAIN, 100 SEC

Figure 30A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
108.0	3	+5.0300000E+02	+3.4641016E+01	+5.2300000E+02	+4.6300000E+02	+4.2819140E+02
116.0	3	+5.3500000E+02	+2.0074859E+01	+5.5600000E+02	+5.1600000E+02	+4.3622070E+02
132.0	3	+4.7233325E+02	+1.3650396E+01	+4.8700000E+02	+4.6000000E+02	+4.4906738E+02
144.0	4	+3.1825000E+02	+2.0451161E+01	+3.4300000E+02	+2.9300000E+02	+4.5870263E+02
151.0	3	+4.7133325E+02	+2.5026652E+01	+4.9700000E+02	+4.4700000E+02	+4.6432299E+02
166.0	3	+4.2333325E+02	+2.5166114E+01	+4.5000000E+02	+4.0000000E+02	+4.7636694E+02
191.0	3	+4.5666650E+02	+1.8230011E+01	+4.7300000E+02	+4.3700000E+02	+4.9644018E+02
202.0	3	+4.6133325E+02	+5.1316014E+00	+4.6700000E+02	+4.5700000E+02	+5.0527246E+02
230.0	3	+6.0233325E+02	+1.7473789E+01	+6.1700000E+02	+5.8300000E+02	+5.2775439E+02
241.0	6	+5.2666650E+02	+6.5071243E+01	+6.1300000E+02	+4.3700000E+02	+5.3658666E+02
250.0	12	+5.6016650E+02	+8.1358726E+01	+6.9700000E+02	+4.4300000E+02	+5.4381298E+02

STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,3 % STRAIN AT 100 SEC.

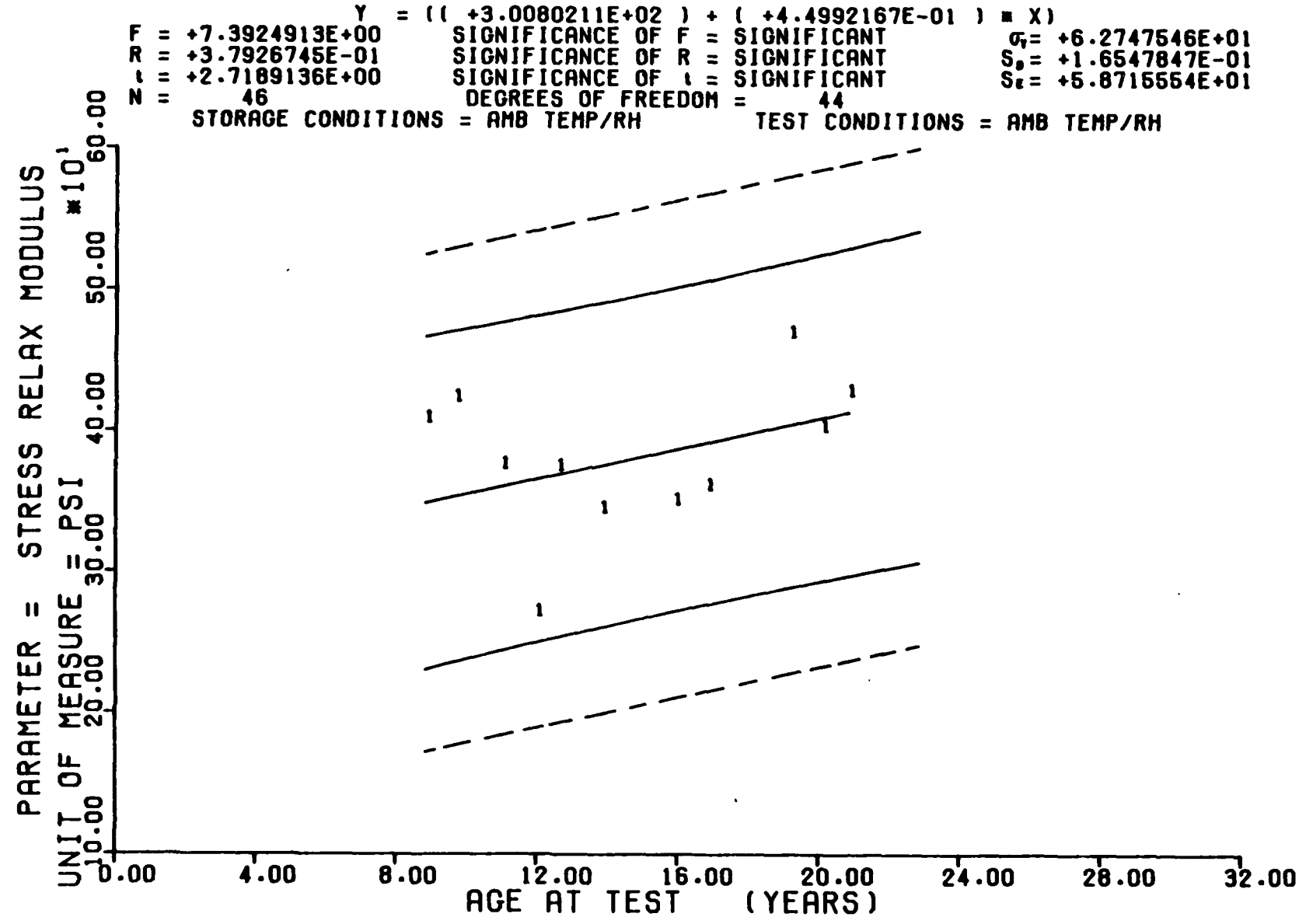
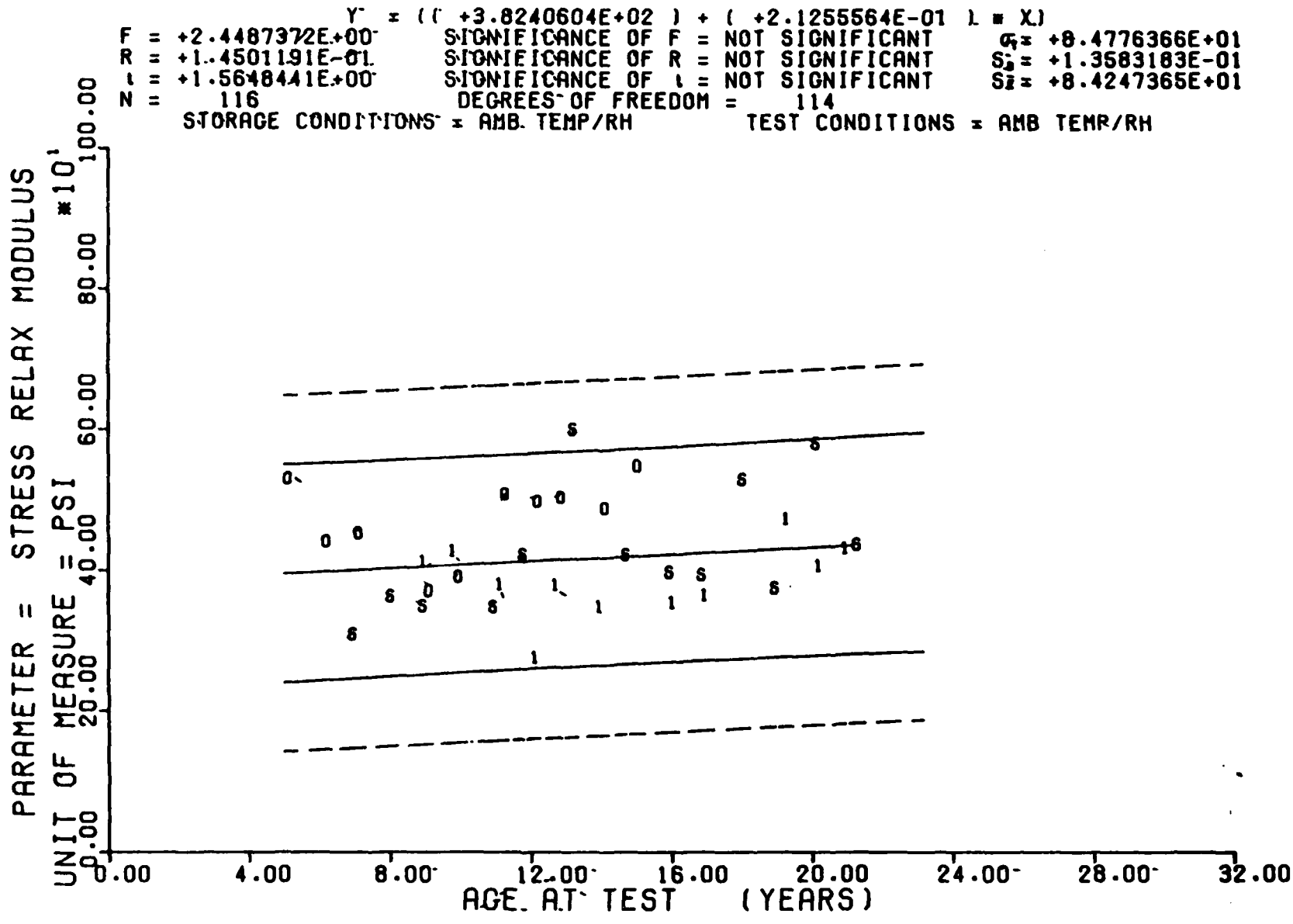

Y = ((+3.0080211E+02) + (+4.4992167E-01) * X)
F = +7.3924913E+00 SIGNIFICANCE OF F = SIGNIFICANT
R = +3.7926745E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +2.7189136E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 46 DEGREES OF FREEDOM = 44
σT= +6.2747546E+01
Se= +1.6547847E-01
St= +5.8715554E+01
STORAGE CONDITIONS = AMB TEMP/RH
TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRESS RELAX MODULUS
UNIT OF MEASURE = PSI *10¹
60.00
50.00
40.00
30.00
20.00
10.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.3 % STRAIN AT 1000 SEC.

Figure 31



TP-H1011 DISSECTED MTRS. STRESS RELAXATION MODULUS. 3 PERCENT STRAIN. 1000 SEC

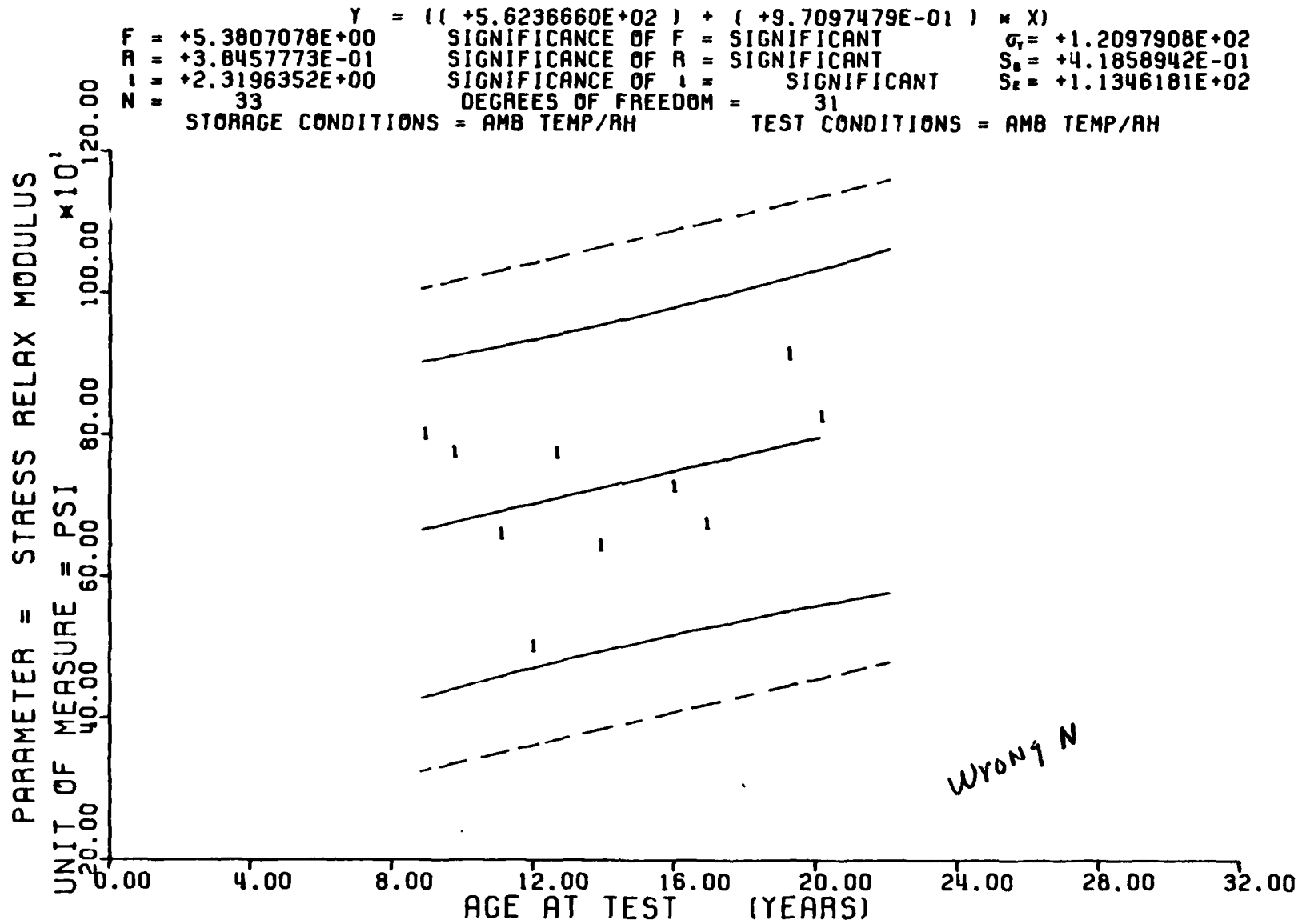
Figure 31A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

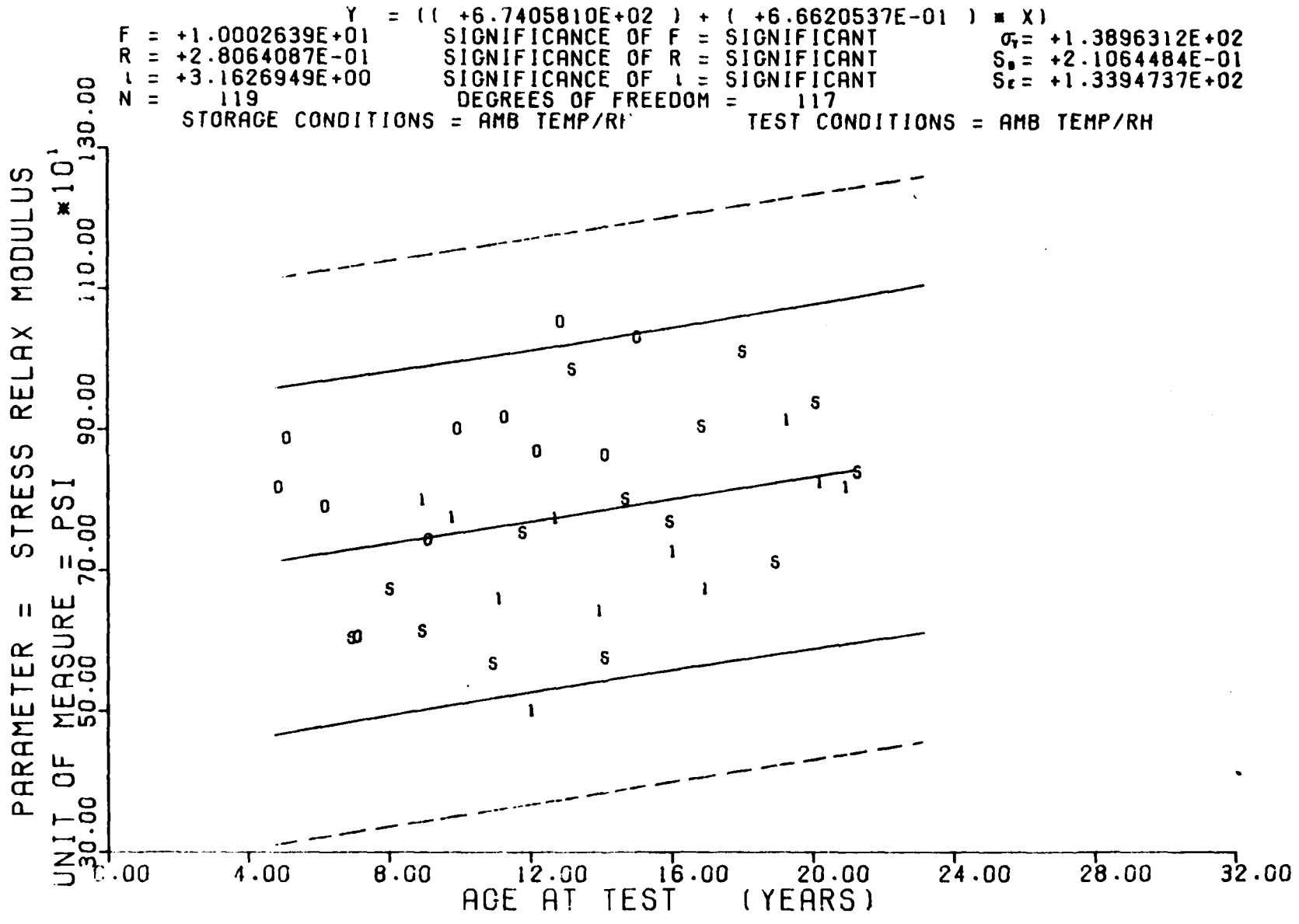
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+4.0600000E+02	+3.4641016E+01	+4.2600000E+02	+3.6600000E+02	+3.4849365E+02
116.0	3	+4.2066650E+02	+1.3613718E+01	+4.3600000E+02	+4.1000000E+02	+3.5299291E+02
132.0	3	+3.7333325E+02	+1.2342339E+01	+3.8700000E+02	+3.6300000E+02	+3.6019165E+02
144.0	4	+2.6900000E+02	+2.3888630E+01	+3.0300000E+02	+2.4700000E+02	+3.6559082E+02
151.0	3	+3.7200000E+02	+1.8520259E+01	+3.9000000E+02	+3.5300000E+02	+3.6874023E+02
166.0	3	+3.4233325E+02	+1.6623276E+01	+3.6000000E+02	+3.2700000E+02	+3.7548901E+02
191.0	3	+3.4800000E+02	+1.1532562E+01	+3.6000000E+02	+3.3700000E+02	+3.8673706E+02
202.0	3	+3.5866650E+02	+5.1316014E+00	+3.6300000E+02	+3.5300000E+02	+3.9168627E+02
230.0	3	+4.6666650E+02	+2.0550750E+01	+4.8000000E+02	+4.4300000E+02	+4.0428393E+02
241.0	6	+4.0016650E+02	+4.3462244E+01	+4.5300000E+02	+3.3700000E+02	+4.0923315E+02
250.0	12	+4.2525000E+02	+6.6449057E+01	+5.5300000E+02	+3.3700000E+02	+4.1328247E+02

STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.3 % STRAIN AT 1000 SEC.



STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,5 % STRAIN AT 10 SEC.

Figure 32



TP-H1011 DISSECTED MTRS, STRESS RELAXATION MODULUS, 5 PERCENT STRAIN, 10 SEC

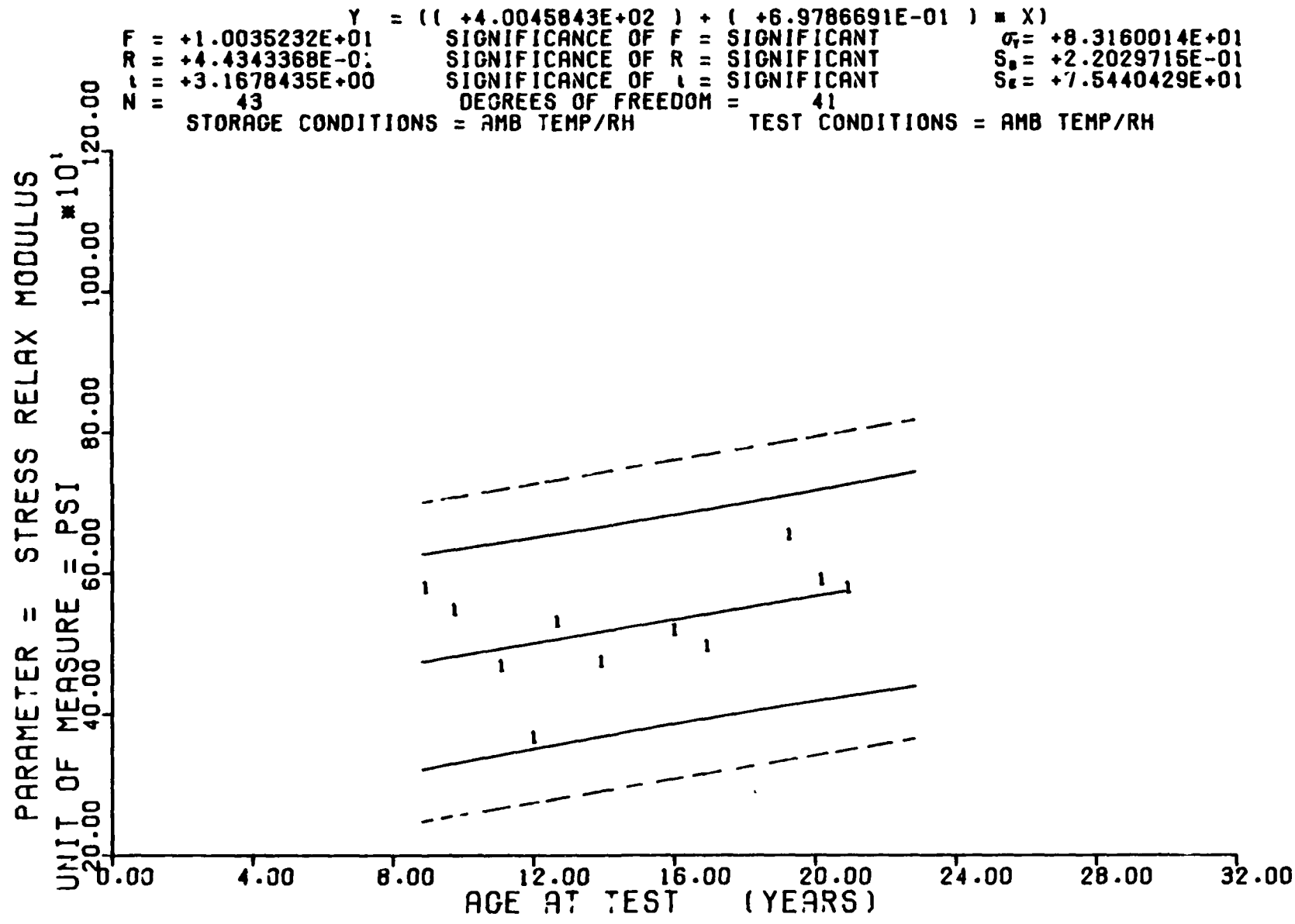
Figure 32A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

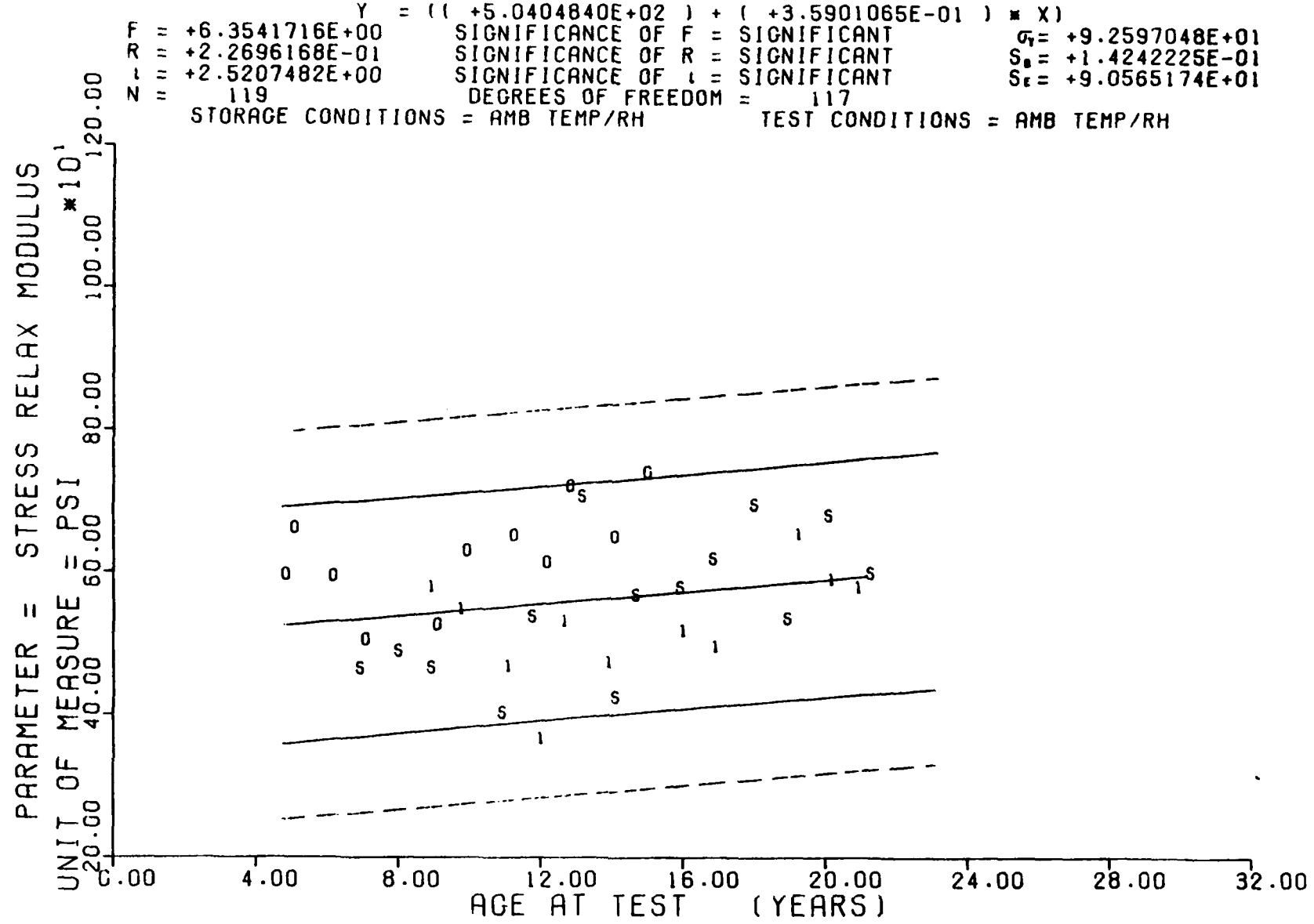
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+7.9400000E+02	+9.4636145E+01	+9.0000000E+02	+7.1800000E+02	+6.6384643E+02
116.0	3	+7.6866650E+02	+6.4291005E+00	+7.7600000E+02	+7.6400000E+02	+6.7392626E+02
132.0	3	+6.5333325E+02	+5.5473717E+01	+7.0000000E+02	+5.9200000E+02	+6.9005444E+02
143.0	3	+4.9466650E+02	+3.4312291E+01	+5.2600000E+02	+4.5800000E+02	+7.0114233E+02
151.0	3	+7.6800000E+02	+9.9999999E+00	+7.7800000E+02	+7.5800000E+02	+7.0920654E+02
166.0	3	+6.3666650E+02	+4.5003703E+01	+6.7200000E+02	+5.8600000E+02	+7.2432641E+02
191.0	3	+7.2000000E+02	+1.2489995E+01	+7.3000000E+02	+7.0600000E+02	+7.4952661E+02
202.0	3	+6.6800000E+02	+1.3114877E+01	+6.8200000E+02	+6.5600000E+02	+7.6061450E+02
230.0	3	+9.0733325E+02	+3.8279672E+01	+9.5000000E+02	+8.7600000E+02	+7.8883862E+02
241.0	6	+8.1933325E+02	+9.9032654E+01	+9.7800000E+02	+7.1000000E+02	+7.9992675E+02
250.0	10	+8.1259985E+02	+8.2430037E+01	+9.7200000E+02	+6.9200000E+02	+8.0899877E+02

STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,5 % STRAIN AT 10 SEC.



STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.5 % STRAIN AT 50 SEC.

Figure 33



TP-H1011 DISSECTED MTRS,STRESS RELAXATION MODULUS, 5 PERCENT STRAIN, 50 SEC

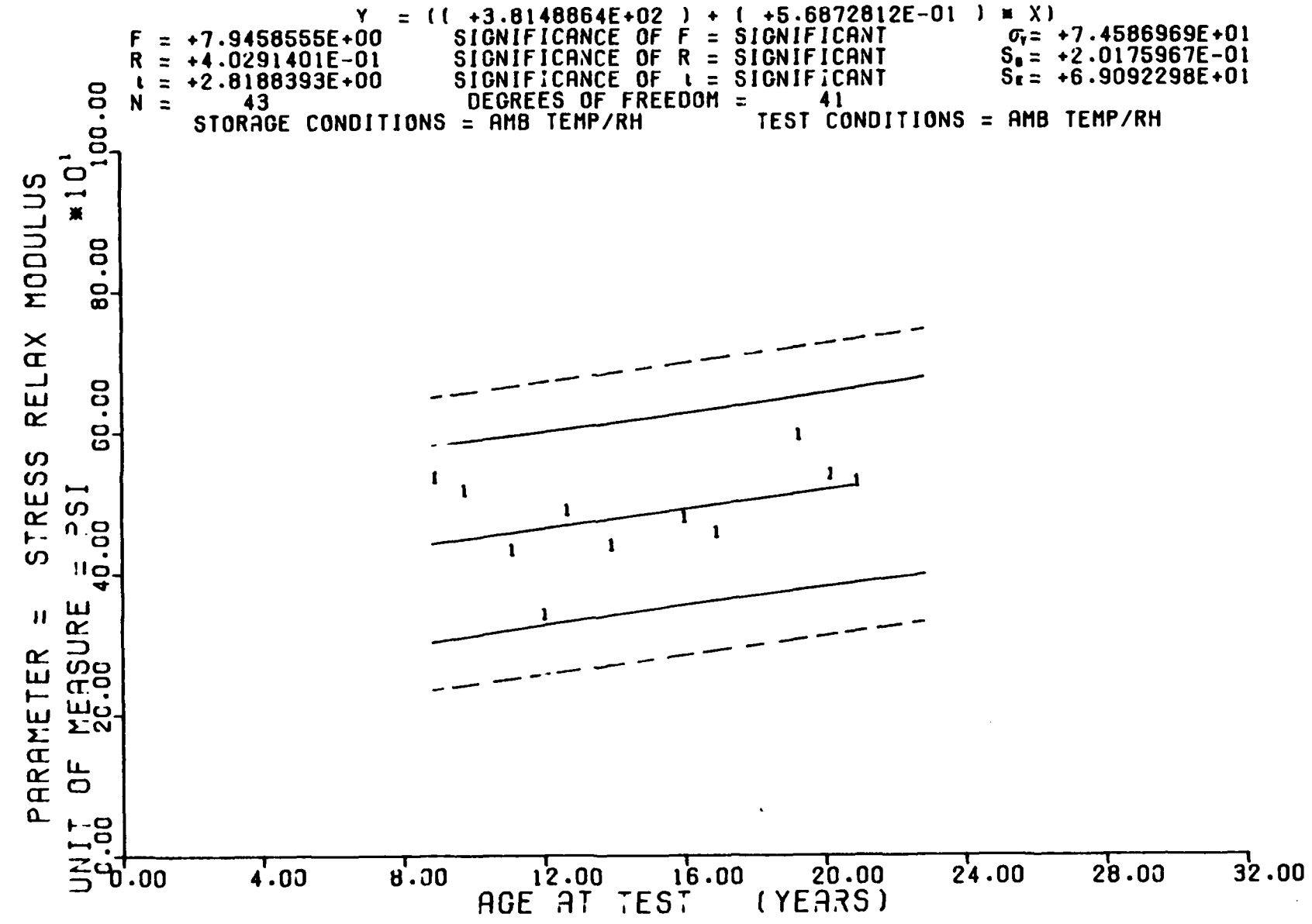
Figure 33A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

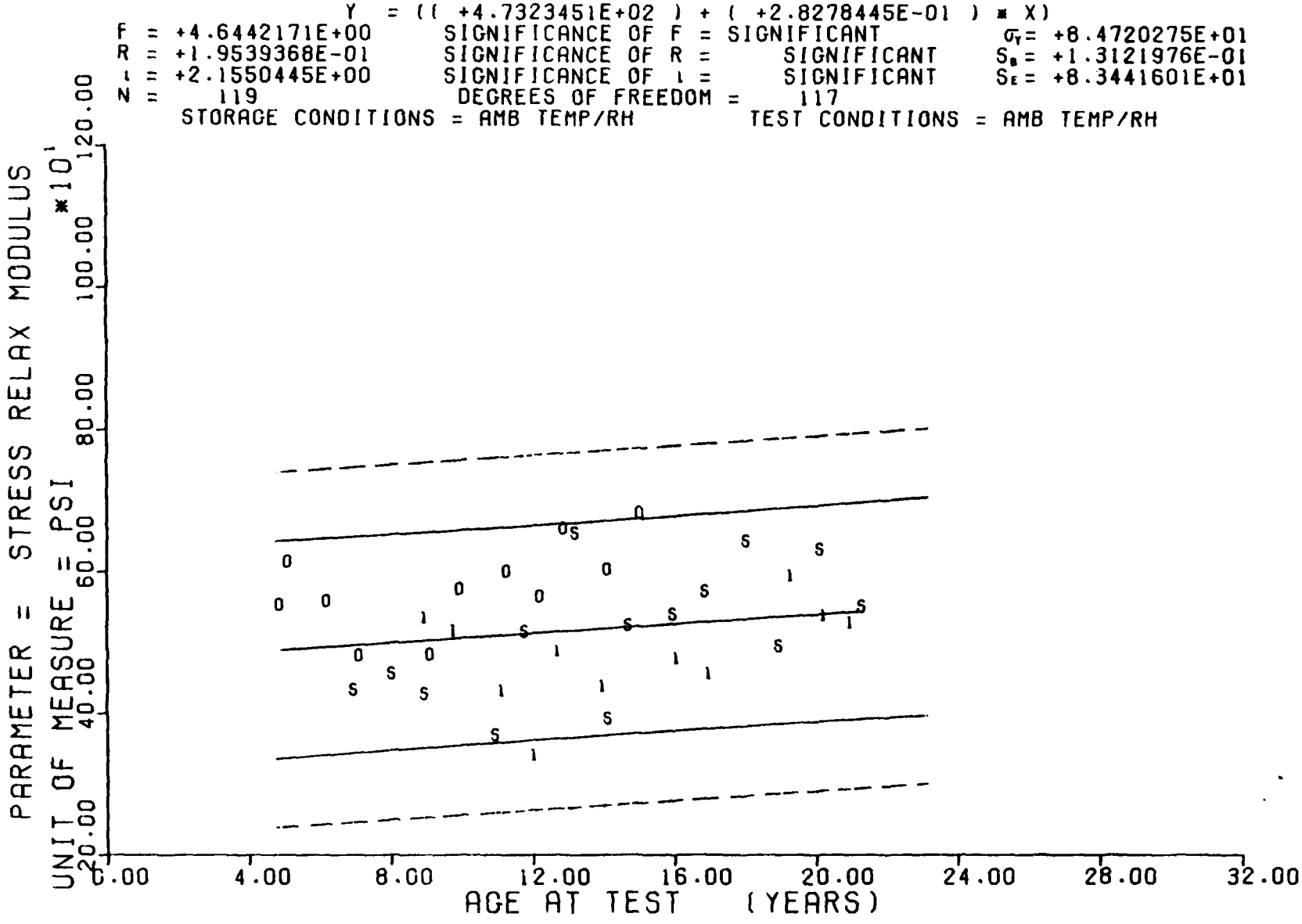
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+5.7333325E+02	+6.7121779E+01	+6.4800000E+02	+5.1800000E+02	+4.7443212E+02
116.0	3	+5.4200000E+02	+1.2489995E+01	+5.5600000E+02	+5.3200000E+02	+4.8141088E+02
132.0	3	+4.6200000E+02	+4.1327956E+01	+4.9600000E+02	+4.1600000E+02	+4.9257666E+02
143.0	3	+3.6066650E+02	+2.3180451E+01	+3.8200000E+02	+3.3600000E+02	+5.0025317E+02
151.0	3	+5.2533325E+02	+8.0829037E+00	+5.3400000E+02	+5.1800000E+02	+5.0583618E+02
166.0	3	+4.6800000E+02	+2.6457513E+01	+4.8800000E+02	+4.3800000E+02	+5.1630419E+02
191.0	3	+5.1266650E+02	+5.7735026E+00	+5.1600000E+02	+5.0600000E+02	+5.3375097E+02
202.0	3	+4.9000000E+02	+5.9999999E+00	+4.9600000E+02	+4.8400000E+02	+5.4142749E+02
230.0	3	+6.4800000E+02	+1.4422205E+01	+6.6400000E+02	+6.3600000E+02	+5.6096777E+02
241.0	6	+5.8433325E+02	+8.9901427E+01	+7.3200000E+02	+4.9000000E+02	+5.6864428E+02
250.0	10	+5.7300000E+02	+6.1255385E+01	+6.8600000E+02	+4.9000000E+02	+5.7492504E+02

STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,5 % STRAIN AT 50 SEC.



STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.5 % STRAIN AT 100 SEC.

Figure 34



TP-H1011 DISSECTED MTRS, STRESS RELAXATION MODULUS, 5 PERCENT STRAIN, 100 SEC

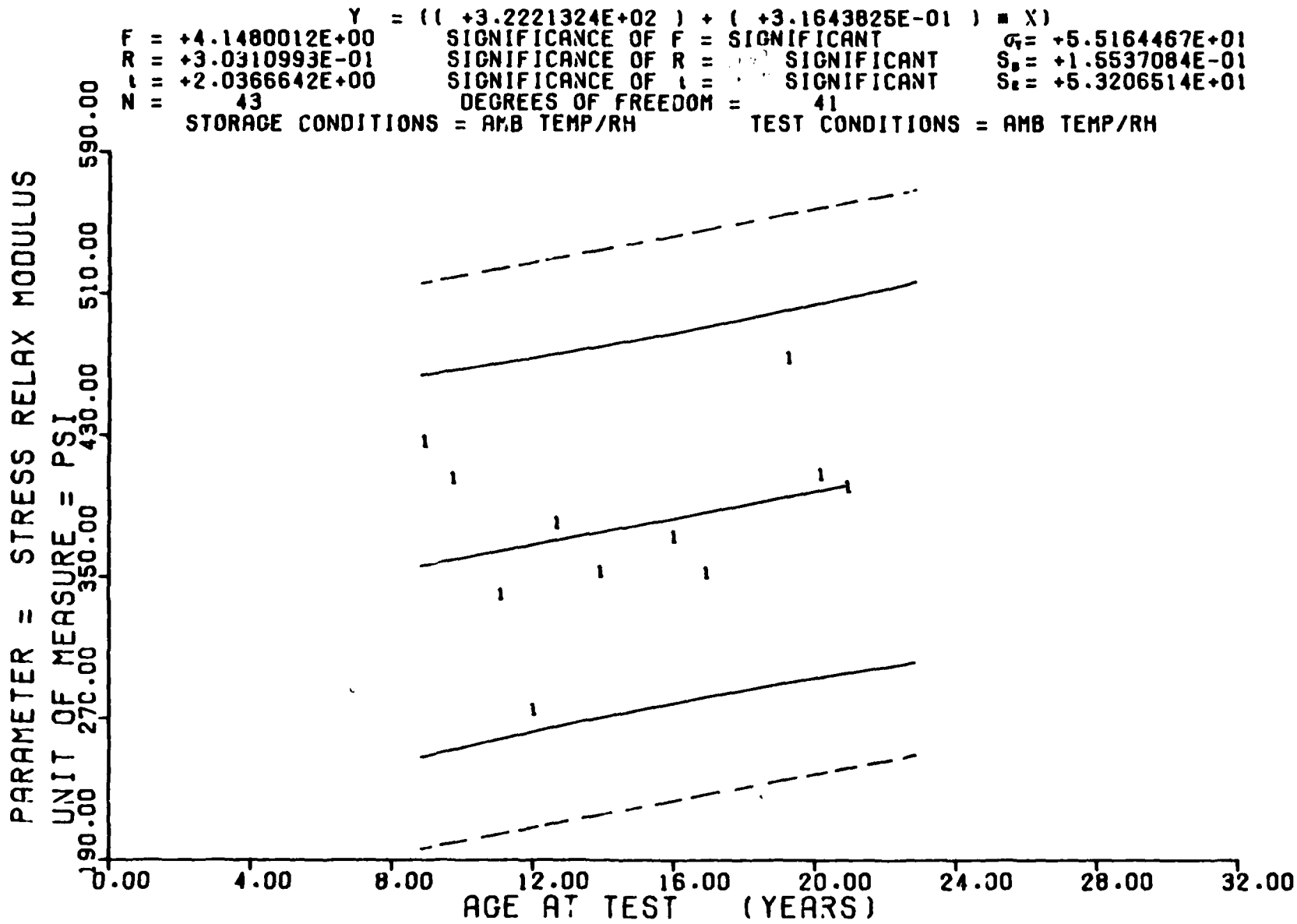
Figure 14A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

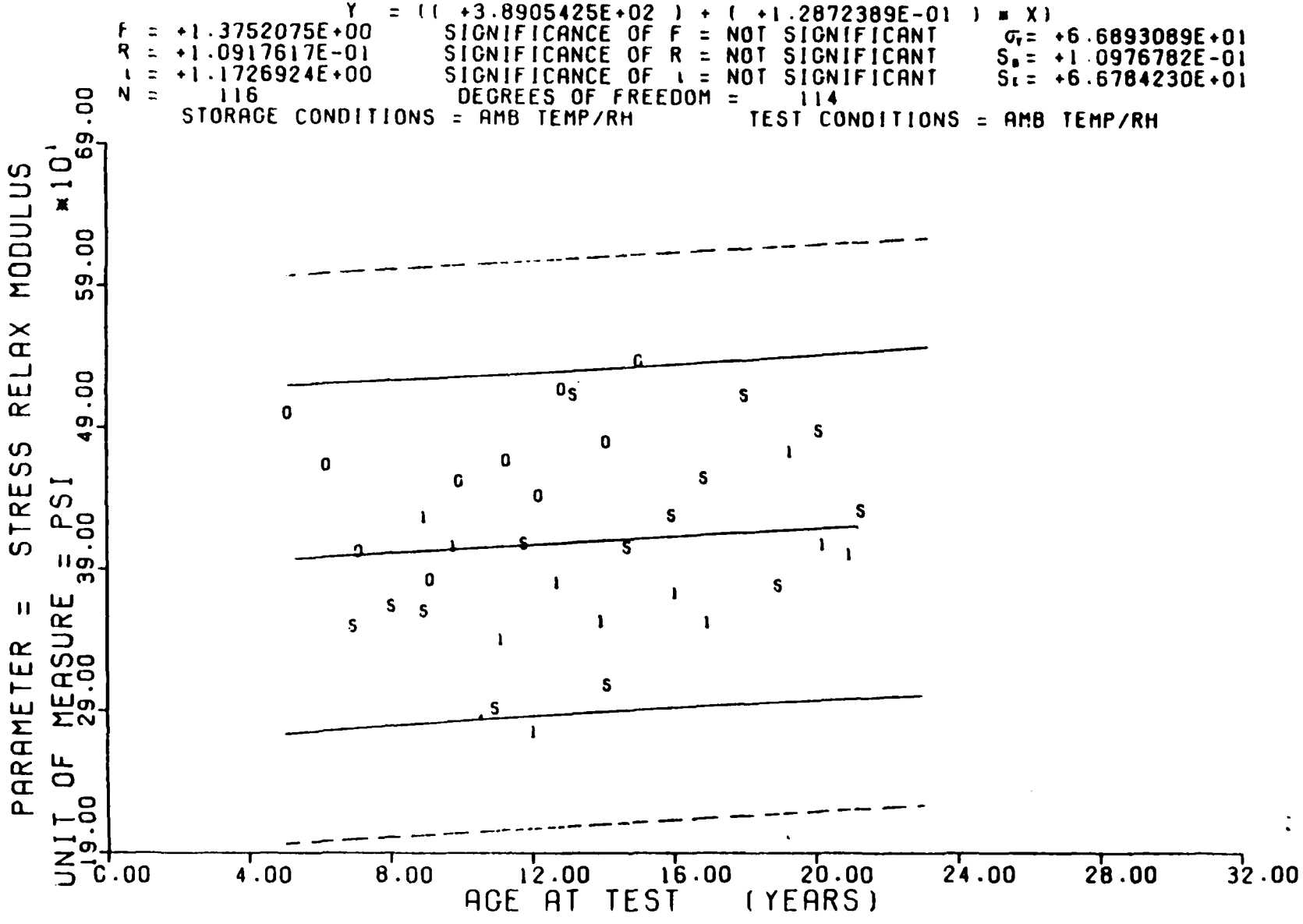
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+5.2866650E+02	+6.2139627E+01	+5.9800000E+02	+4.7800000E+02	+4.4177368E+02
116.0	3	+5.1066650E+02	+1.1547005E+01	+5.2400000E+02	+5.0400000E+02	+4.4746093E+02
132.0	3	+4.2600000E+02	+3.7469987E+01	+4.5600000E+02	+3.8400000E+02	+4.5656054E+02
143.0	3	+3.3466650E+02	+2.1197484E+01	+3.5400000E+02	+3.1200000E+02	+4.6281665E+02
151.0	3	+4.8200000E+02	+7.2111025E+00	+4.9000000E+02	+4.7600000E+02	+4.6736645E+02
166.0	3	+4.3266650E+02	+2.5006665E+01	+4.5000000E+02	+4.0400000E+02	+4.7589746E+02
191.0	3	+4.7200000E+02	+3.4641016E+00	+4.7400000E+02	+4.6800000E+02	+4.9011547E+02
202.0	3	+4.5066650E+02	+6.1101009E+00	+4.5600000E+02	+4.4400000E+02	+4.9637158E+02
230.0	3	+5.8866650E+02	+1.5143755E+01	+6.0600000E+02	+5.7800000E+02	+5.1229589E+02
241.0	6	+5.3266650E+02	+8.2060140E+01	+6.6800000E+02	+4.4600000E+02	+5.1855200E+02
250.0	10	+5.2259985E+02	+5.7237190E+01	+6.2400000E+02	+4.4200000E+02	+5.2367065E+02

STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,5 % STRAIN AT 100 SEC.



STAGE 1.DISCTED MOTOR=0012199.STRESS RELAXATION MODULUS.5 % STRAIN AT 1000 SEC.

Figure 35



TP-H1011 DISSECTED MTRS. STRESS RELAXATION MODULUS. 5 PERCENT STRAIN. 1000 SEC

Figure 35A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	3	+4.2333325E+02	+5.0649119E+01	+4.7800000E+02	+3.7800000E+02	+3.5575561E+02
116.0	3	+4.0266650E+02	+1.3316656E+01	+4.1800000E+02	+3.9400000E+02	+3.5891992E+02
132.0	3	+3.3733325E+02	+2.5716402E+01	+3.5600000E+02	+3.0800000E+02	+3.6398291E+02
143.0	3	+2.7200000E+02	+1.9078784E+01	+2.9000000E+02	+2.5200000E+02	+3.6746386E+02
151.0	3	+3.7733325E+02	+7.0237691E+00	+3.8400000E+02	+3.7000000E+02	+3.6999536E+02
166.0	3	+3.5000000E+02	+1.9078784E+01	+3.6200000E+02	+3.2800000E+02	+3.7474194E+02
191.0	3	+3.7000000E+02	+3.4641016E+00	+3.7400000E+02	+3.6800000E+02	+3.8265283E+02
202.0	3	+3.4933325E+02	+1.1547005E+00	+3.5000000E+02	+3.4800000E+02	+3.8613354E+02
230.0	3	+4.7066650E+02	+8.3266639E+00	+4.8000000E+02	+4.6400000E+02	+3.9499389E+02
241.0	6	+4.0500000E+02	+5.7267791E+01	+5.0200000E+02	+3.4600000E+02	+3.9847485E+02
250.0	10	+3.9800000E+02	+4.4899888E+01	+4.7400000E+02	+3.3000000E+02	+4.0132275E+02

STAGE 1,DISCTED MOTOR=0012199,STRESS RELAXATION MODULUS,5 % STRAIN AT 1000 SEC.

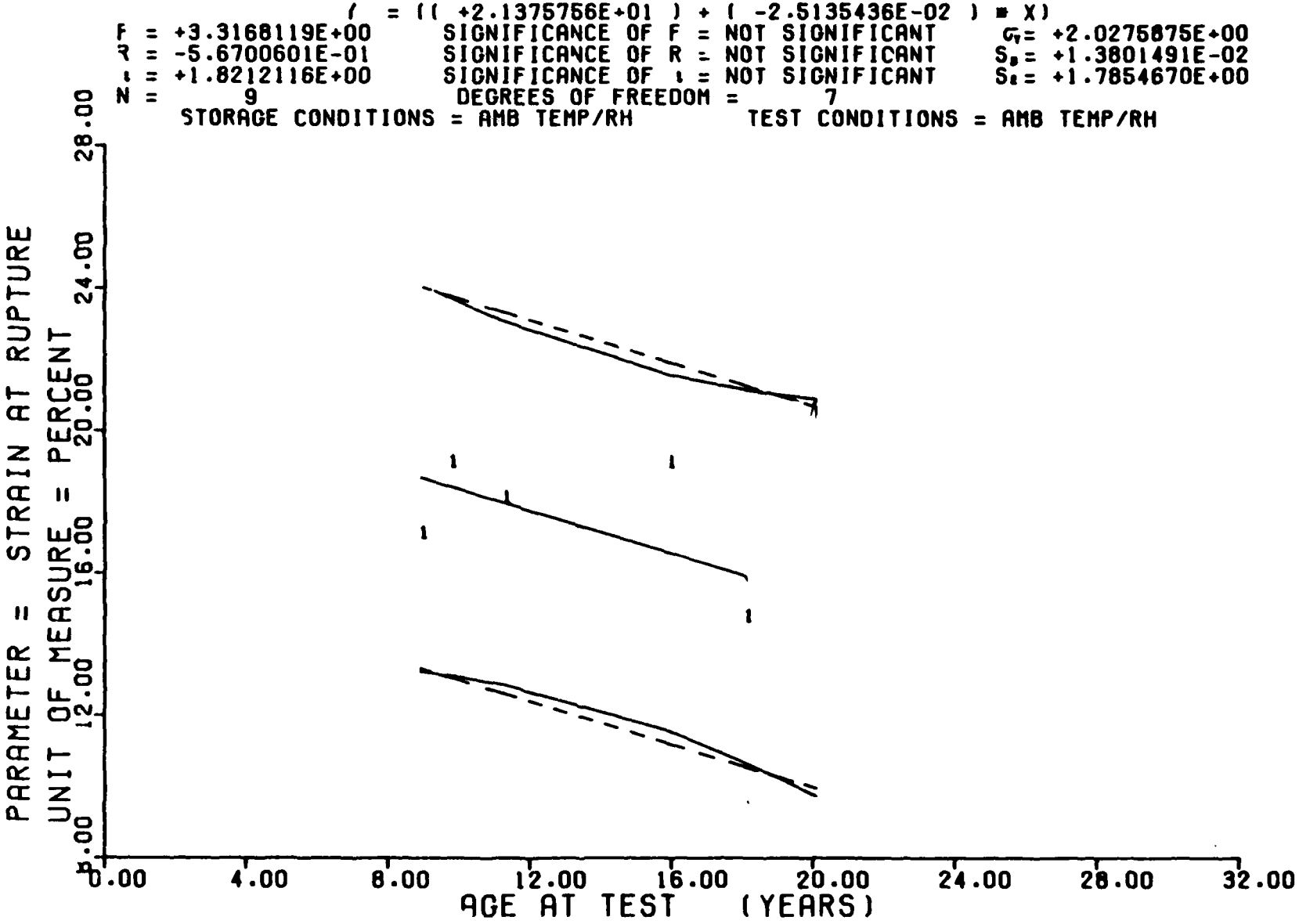
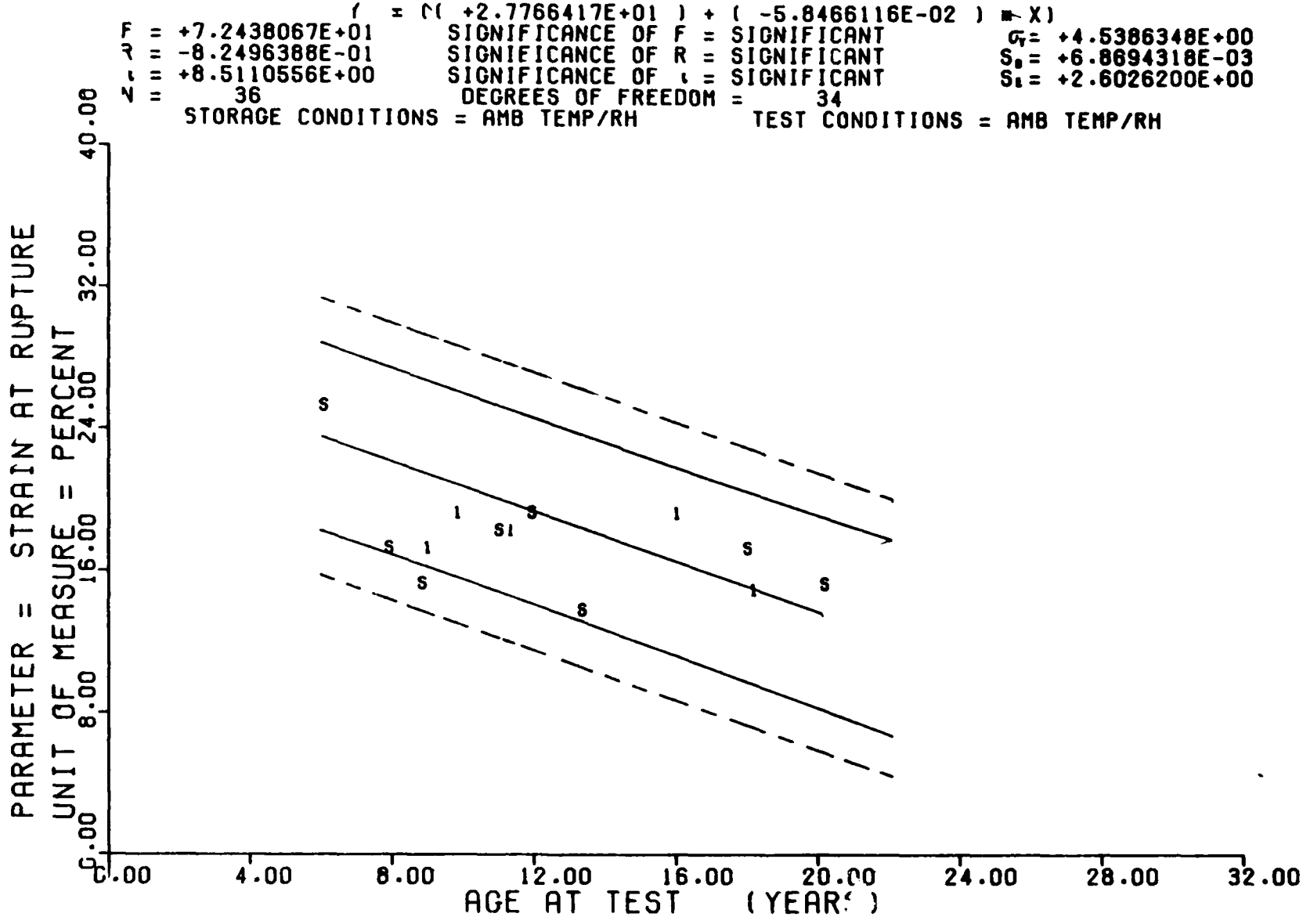

Y = ((+2.1375766E+01) + (-2.5135436E-02) * X)
F = +3.3168119E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY= +2.0275875E+00
R = -5.6700601E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT SB= +1.3801491E-02
t = +1.8212116E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT SE= +1.7854670E+00
N = 9 DEGREES OF FREEDOM = 7
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = STRAIN AT RUPTURE
UNIT OF MEASURE = PERCENT
28.00
24.00
20.00
16.00
12.00
8.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1.DSSCTD MTR=0012199.CONTANT STRAIN.STRAIN 0.1 INIT & 0.01 EVERY 48 HRS.

Figure 36



STAGE 1,DSSCTD MTR COMBINED,CONTANT STRAIN,STRAIN 0.1 INIT & 0.01 EVERY 48 HRS.

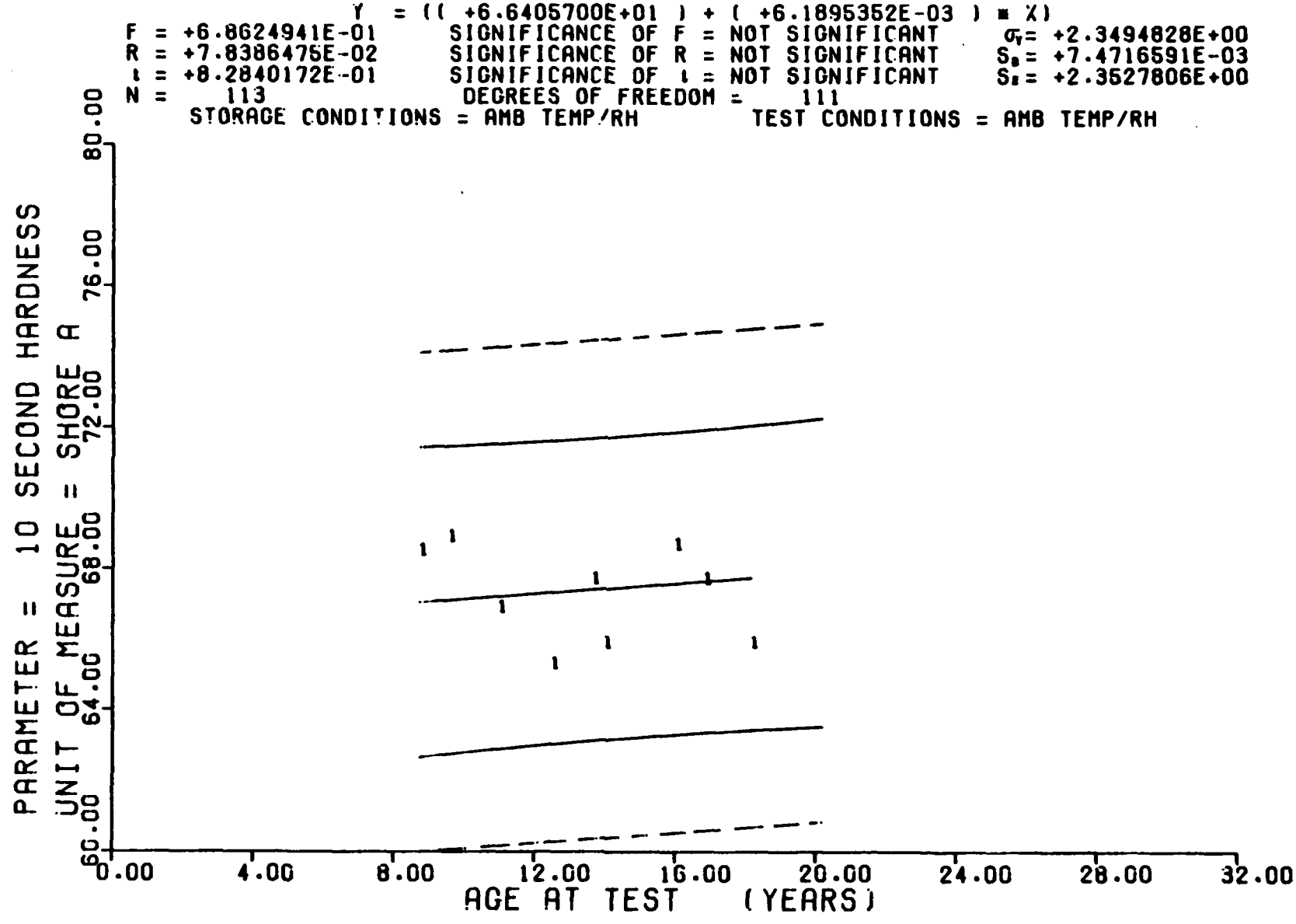
Figure 36A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

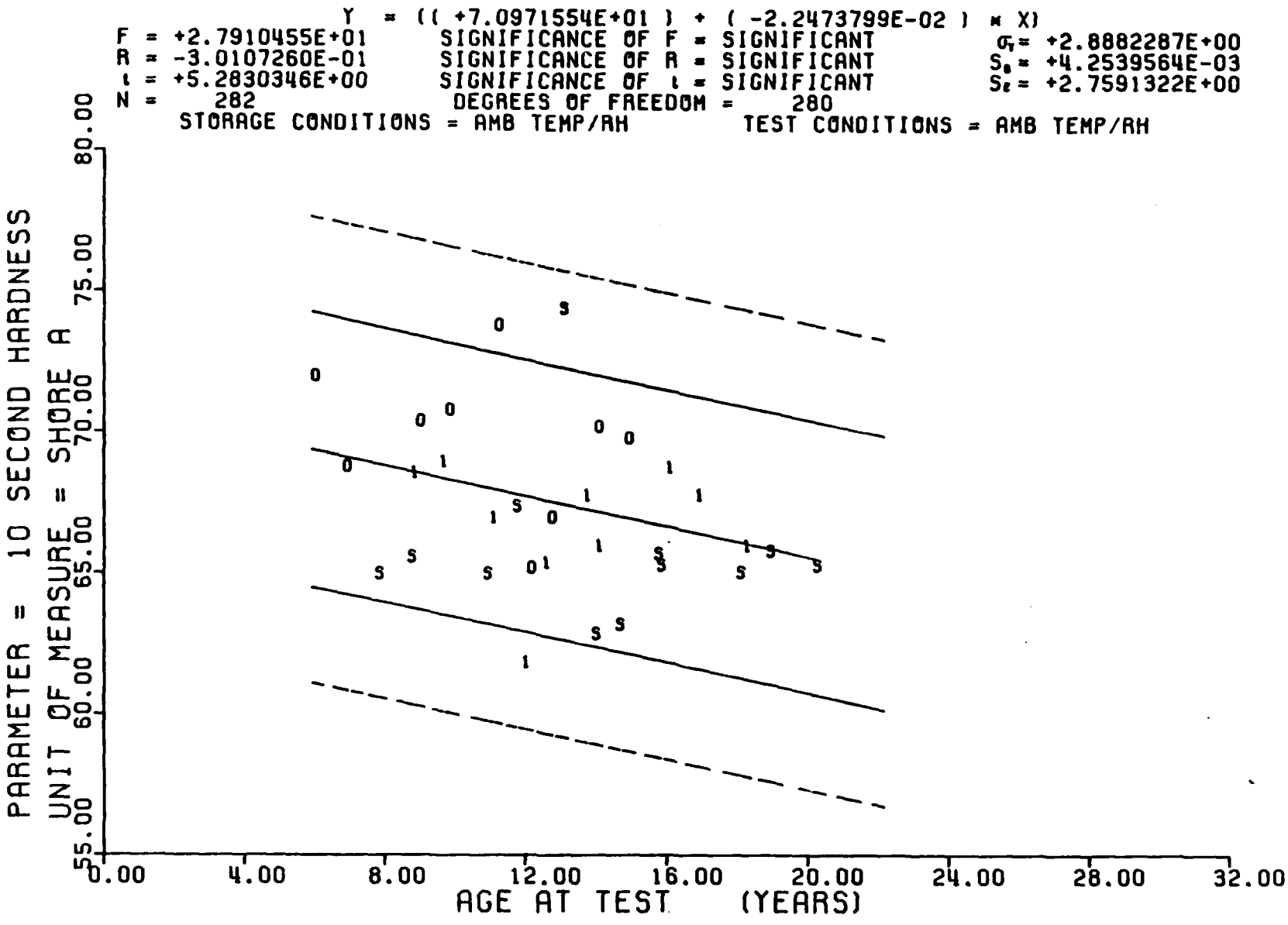
AGE (HOURS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
107.0	1	+1.7000000E+01	+0.0000000E+07	+1.7000000E+01	+1.7000000E+01	+1.8686264E+01
117.0	1	+1.9000000E+01	+0.0000000E+07	+1.9000000E+01	+1.9000000E+01	+1.8434906E+01
125.0	2	+1.8000000E+01	+1.4142135E+00	+1.9000000E+01	+1.7000000E+01	+1.7982467E+01
141.0	2	+1.9000000E+01	+0.0000000E+07	+1.9000000E+01	+1.9000000E+01	+1.6574874E+01
317.0	3	+1.4666666E+01	+5.7735026E-01	+1.5000000E+01	+1.4000000E+01	+1.5921366E+01

STAGE 1.DESCTD MTR=0012199.CONTANT STRAIN.STRAIN 0.1 INIT & 0.01 EVERY 48 HRS.



STAGE 1, DISSECTED MOTOR=(1)0012199, SHORE-A HARDNESS, 10 SECOND.

Figure 37



STAGE 1 DISCTED MOTORS= (0) 12099, (1) 12199, (S) STM012, HARDNESS, SHORE A 10-SEC.

Figure 37A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
105.0	5	+6.8399993E+01	+1.5165750E+00	+7.0000000E+01	+6.7000000E+01	+6.7055587E+01
115.0	5	+6.8799987E+01	+1.0954451E+00	+7.0000000E+01	+6.7000000E+01	+6.7117492E+01
132.0	5	+6.6799987E+01	+2.2803508E+00	+6.9000000E+01	+6.4000000E+01	+6.7222717E+01
143.0	3	+6.1666656E+01	+1.5275252E+00	+6.3000000E+01	+6.0000000E+01	+6.7290802E+01
150.0	5	+6.5199996E+01	+4.4721359E-01	+6.6000000E+01	+6.5000000E+01	+6.7334121E+01
164.0	10	+6.7599990E+01	+1.1737877E+00	+7.0000000E+01	+6.6000000E+01	+6.7420776E+01
168.0	10	+6.5799987E+01	+1.2292725E+00	+6.8000000E+01	+6.4000000E+01	+6.7445541E+01
192.0	50	+6.8579986E+01	+2.3307176E+00	+7.1000000E+01	+6.0000000E+01	+6.7594085E+01
202.0	10	+6.7599990E+01	+1.1737877E+00	+7.0000000E+01	+6.6000000E+01	+6.7655975E+01
218.0	10	+6.5799987E+01	+1.2292725E+00	+6.8000000E+01	+6.4000000E+01	+6.7755004E+01

STAGE 1. DISSECTED MOTOR=(1)0012199. SHORE-A HARDNESS. 10 SECOND.

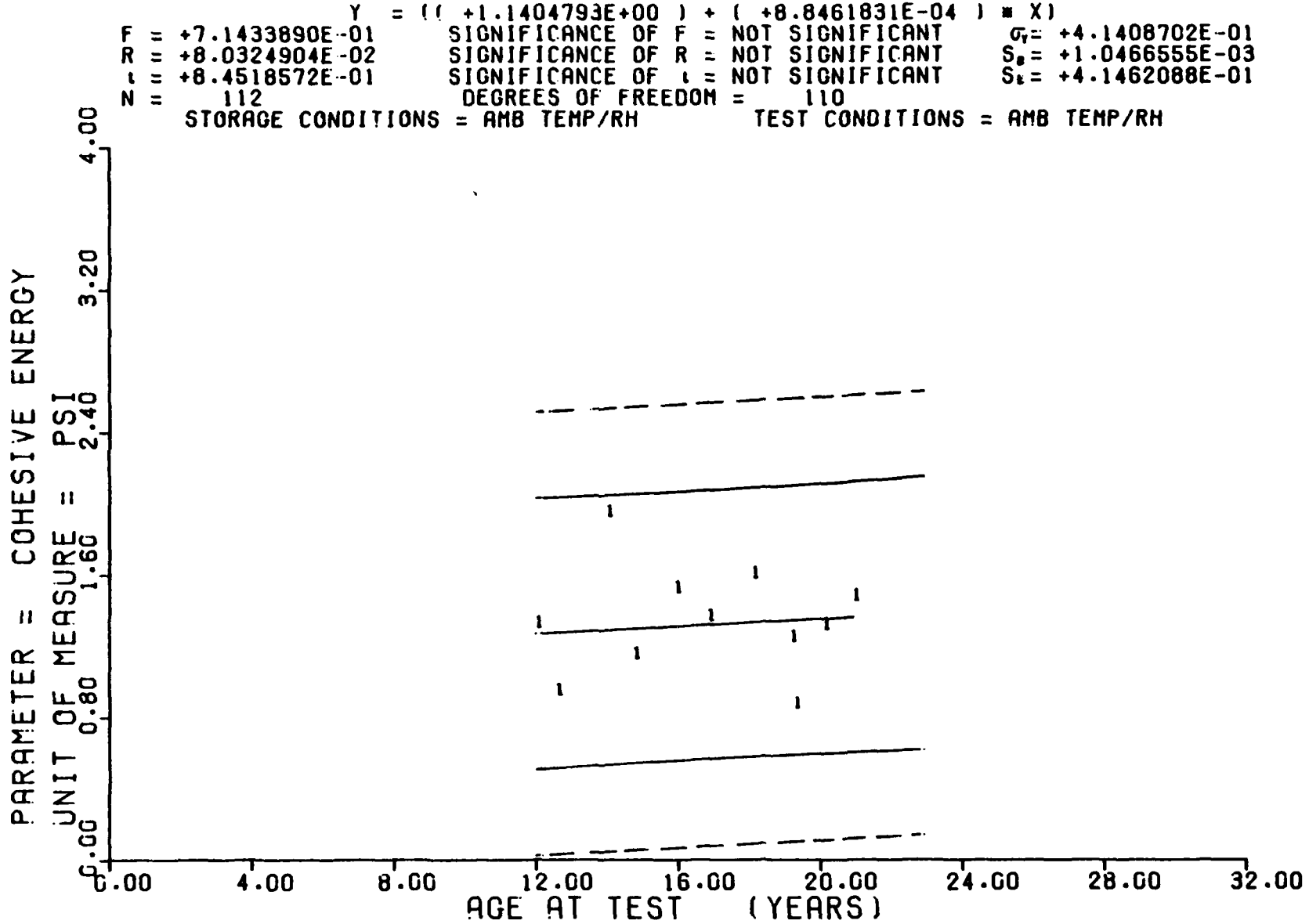

Y = ((+1.1404793E+00) + (+8.8461831E-04) * X)
F = +7.1433890E-01 SIGNIFICANCE OF F = NOT SIGNIFICANT σr= +4.1408702E-01
R = +8.0324904E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Se= +1.0466555E-03
t = +8.4518572E-01 SIGNIFICANCE OF t = NOT SIGNIFICANT St= +4.1462088E-01
N = 112 DEGREES OF FREEDOM = 110
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COHESIVE ENERGY
UNIT OF MEASURE = PSI
0.00
0.80
1.60
2.40
3.20
4.00
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1,DISSECTED MOTOR=0012199,TEAR ENERGY,CHS=0.1 IN/MIN,T/TEMP=77 DEG.

Figure 38

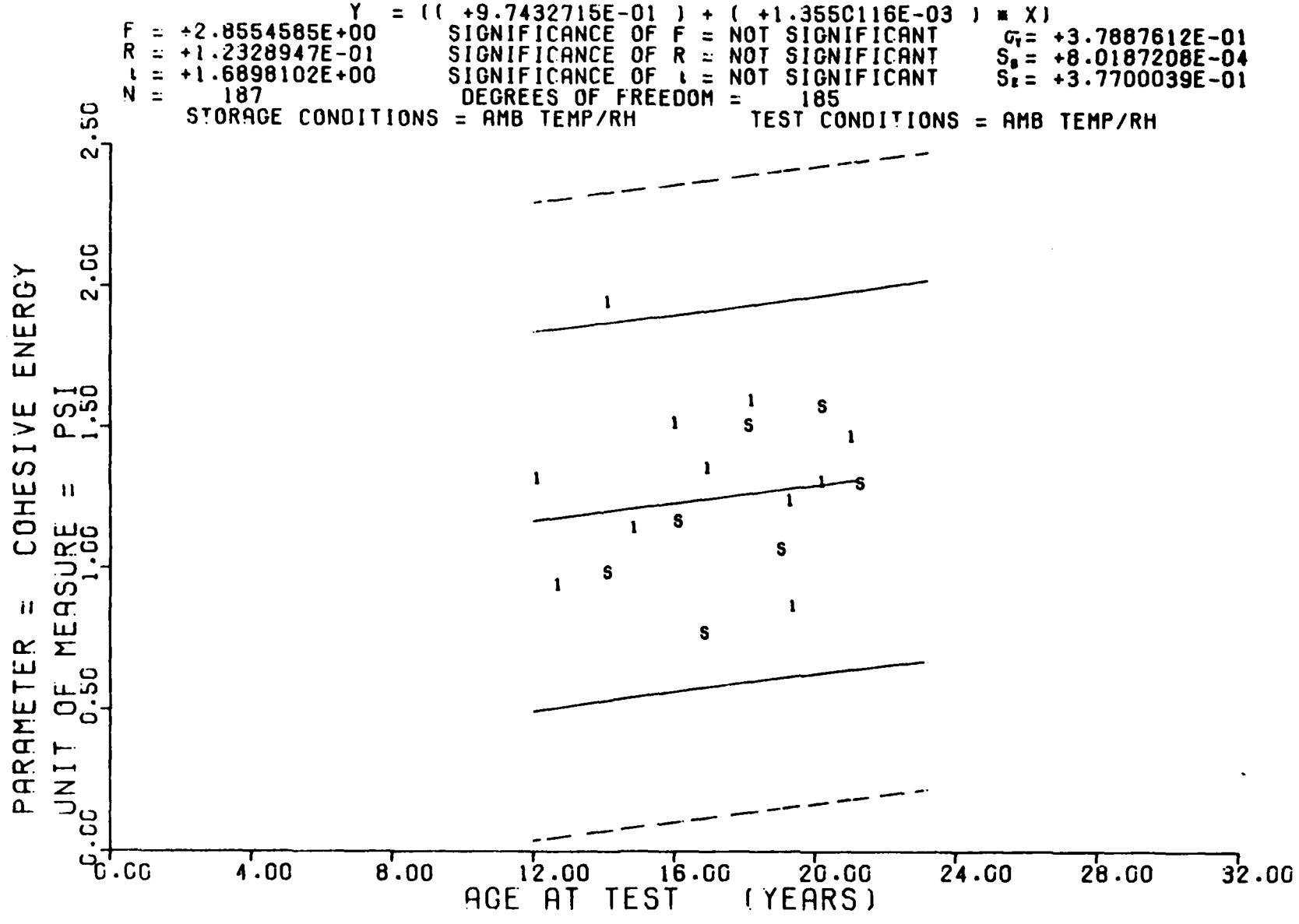

Y = ((+9.7432715E-01) + (+1.3550116E-03) * X)
F = +2.8554585E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σ1 = +3.7887612E-01
R = +1.2328947E-01 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb = +8.0187208E-04
t = +1.6898102E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT Se = +3.7700039E-01
N = 187 DEGREES OF FREEDOM = 185
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = COHESIVE ENERGY
UNIT OF MEASURE = PSI
0.00
0.50
1.00
1.50
2.00
2.50
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1,DISSECTED MOTORS=(1)0012199 & (S)STM-012,TEAR ENERGY,CHS=0.1 AT 77 DEG

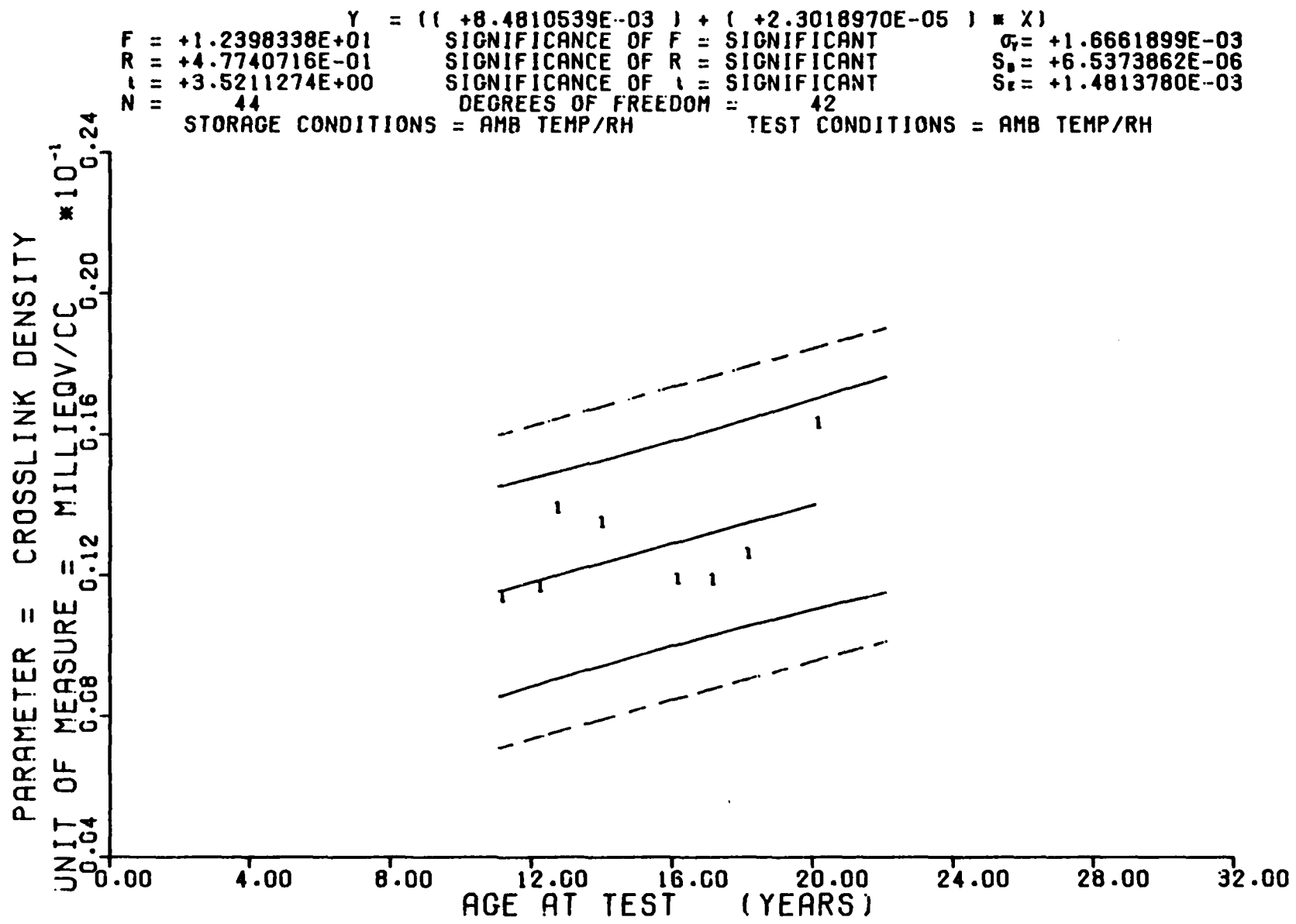
Figure 38A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
144.0	8	+1.3054866E+00	+2.4540969E-01	+1.6974992E+00	+9.1229999E-01	+1.2678642E+00
151.0	17	+9.2757010E-01	+3.4659752E-01	+1.5583992E+00	+5.1189994E-01	+1.2740564E+00
168.0	11	+1.9317884E+00	+4.6594024E-01	+2.5883998E+00	+1.2885999E+00	+1.2890949E+00
177.0	8	+1.1311111E+00	+3.3515019E-01	+1.6190996E+00	+7.6609998E-01	+1.2970561E+00
191.0	6	+1.5033864E+00	+3.2887333E-01	+2.0490999E+00	+9.9919998E-01	+1.3094406E+00
202.0	10	+1.3446292E+00	+2.7193437E-01	+1.7876996E+00	+9.6319997E-01	+1.3191719E+00
217.0	8	+1.5829744E+00	+3.1690500E-01	+2.1384992E+00	+1.1258993E+00	+1.3324413E+00
230.0	9	+1.2281208E+00	+1.4474297E-01	+1.4004993E+00	+9.6739995E-01	+1.3439407E+00
231.0	8	+8.5437452E-01	+4.7410577E-02	+9.3389999E-01	+8.0999994E-01	+1.3448257E+00
241.0	9	+1.2973098E+00	+1.5053359E-01	+1.5008993E+00	+1.1089992E+00	+1.3536720E+00
251.0	16	+1.4568910E+00	+2.9180035E-01	+1.9488992E+00	+1.1238994E+00	+1.3625183E+00

STAGE 1,DISSECTED MOTOR=0012199,TEAR ENERGY,CHS=0.1 IN/MIN,T/TEMP=77 DEG.



DISSECTED MTR, STAGE 1, TP-H1011, SOL GEL, CROSSLINK DENSITY,MOTOR=0012199.

Figure 39

Y = ((+1.0994496E-02) + (+7.2035647E-07) * X)

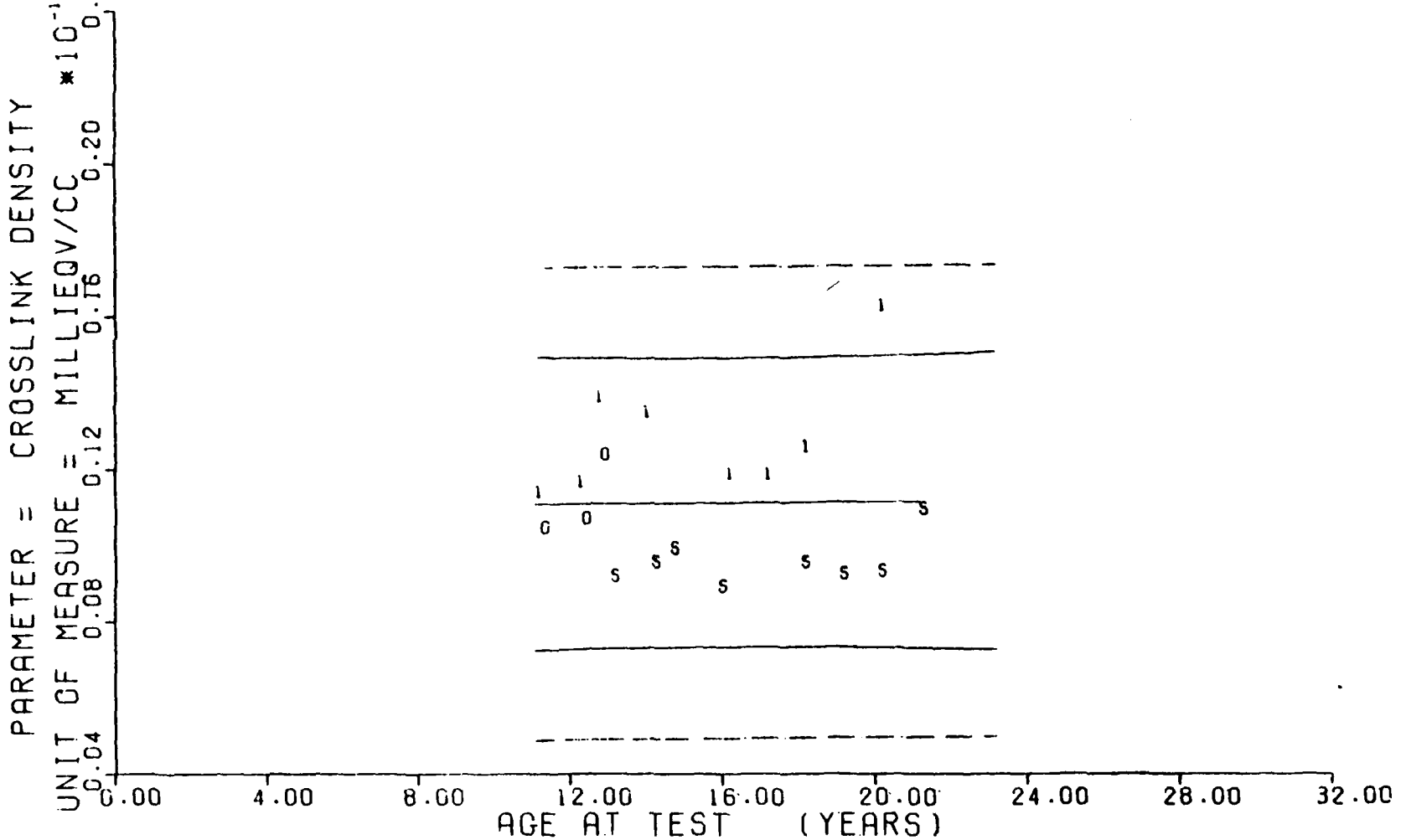
F = +1.4898971E-02 SIGNIFICANCE OF F = NOT SIGNIFICANT σ_Y = +2.0585323E-03

R = +1.2588668E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT S_a = +5.9015939E-06

$\sigma_{Y'}$ = +1.2206134E-01 SIGNIFICANCE OF $\sigma_{Y'}$ = NOT SIGNIFICANT S_ε = +2.0692890E-03

N = 96 DEGREES OF FREEDOM = 94

STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH



DISSECTED MTR. STAGE 1, TP-H1011, SOL GEL, CROSSLINK DENSITY

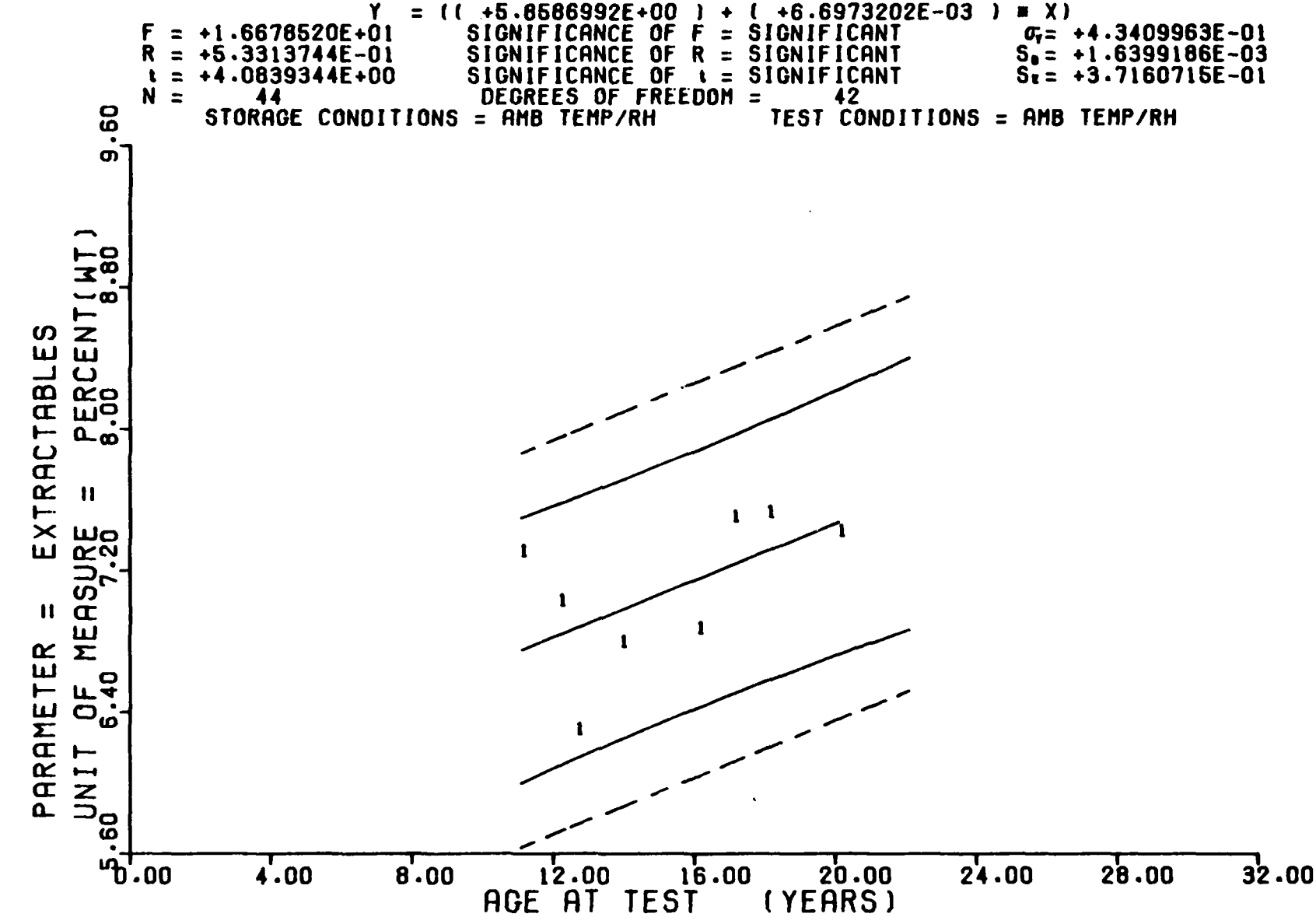
Figure 39A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
133.0	4	+1.1268490E-02	+3.3474359E-04	+1.1685997E-02	+1.0865997E-02	+1.1542573E-02
140.0	4	+1.1549994E-02	+6.5070192E-04	+1.2386996E-02	+1.0865997E-02	+1.1841822E-02
152.0	4	+1.3792496E-02	+7.4063618E-04	+1.4402996E-02	+1.2901999E-02	+1.1979933E-02
167.0	6	+1.3390321E-02	+5.5857095E-04	+1.4407999E-02	+1.2906998E-02	+1.2325219E-02
195.0	6	+1.1778324E-02	+6.3328713E-04	+1.2628998E-02	+1.1050999E-02	+1.2923713E-02
209.0	8	+1.1750556E-02	+5.0922960E-04	+1.2629397E-02	+1.1050697E-02	+1.3199940E-02
217.0	6	+1.2492854E-02	+8.4855124E-04	+1.3279799E-02	+1.1251598E-02	+1.3476170E-02
241.0	6	+1.6193576E-02	+3.8753037E-04	+1.6725398E-02	+1.5627298E-02	+1.4028623E-02

DISSECTED MTR, STAGE 1, TP-H1011, SOL GEL, CROSSLINK DENSITY,MOTOR=0012199.



DISSECTED MTR. STAGE 1. TP-H1011. SOL GEL. PERCENT EXTRACTABLES.MOTOR=0012199.

Figure 40

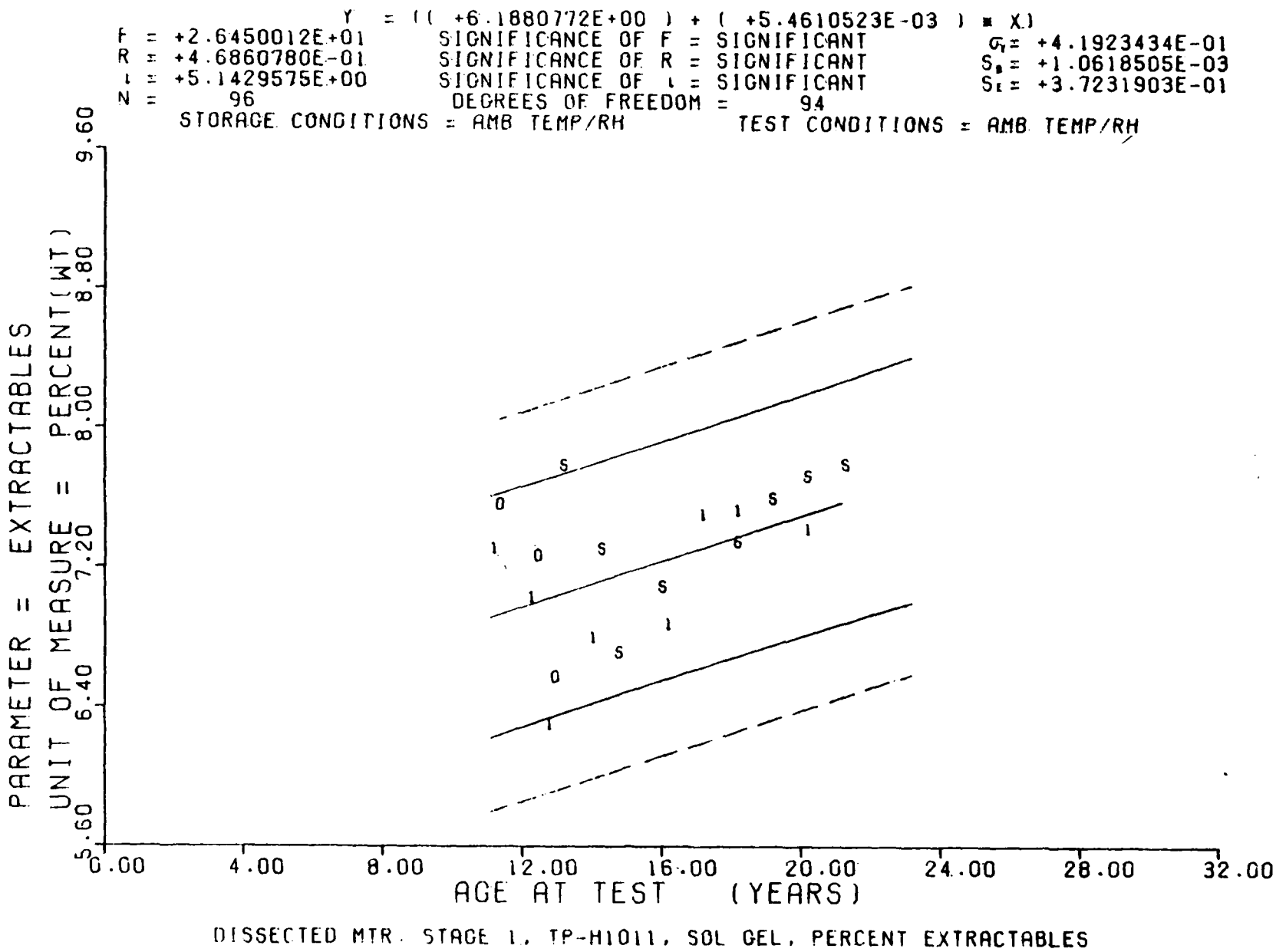

Y = ((+6.1880772E+00) + (+5.4610523E-03) * X)
F = +2.6450012E+01 SIGNIFICANCE OF F = SIGNIFICANT σ1 = +4.1923434E-01
R = +4.6860780E-01 SIGNIFICANCE OF R = SIGNIFICANT Sb = +1.0618505E-03
t = +5.1429575E+00 SIGNIFICANCE OF t = SIGNIFICANT Se = +3.7231903E-01
N = 96 DEGREES OF FREEDOM = 94
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = EXTRACTABLES
UNIT OF MEASURE = PERCENT(WT)
9.60
8.80
8.00
7.20
6.40
5.60
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
DISSECTED MTR. STAGE 1, TP-H1011, SOL GEL, PERCENT EXTRACTABLES

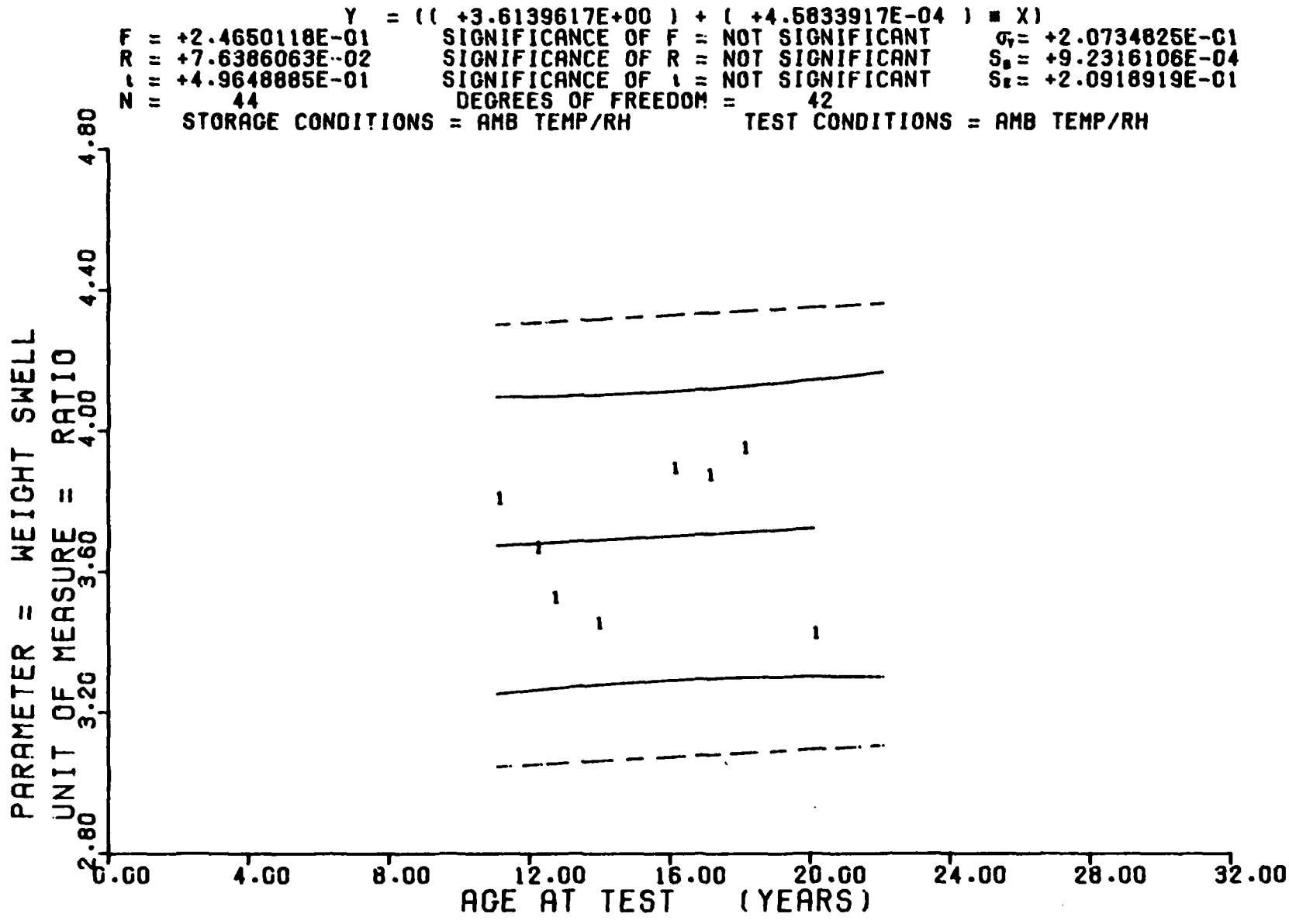
Figure 40A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
133.0	4	+7.2834968E+00	+1.9578631E-02	+7.3009996E+00	+7.2599992E+00	+6.7494421E+00
140.0	4	+7.0024948E+00	+9.1146811E-02	+7.1279993E+00	+6.9349994E+00	+6.8365077E+00
152.0	4	+6.2747459E+00	+2.7618879E-02	+6.3049993E+00	+6.2509994E+00	+6.8766918E+00
167.0	6	+6.7723283E+00	+5.1643936E-02	+6.8399991E+00	+6.6919994E+00	+6.9771509E+00
173.0	6	+6.8493270E+00	+7.7972285E-02	+6.9799995E+00	+6.7629995E+00	+7.1512813E+00
205.0	8	+7.4779949E+00	+1.7698082E-01	+7.7169990E+00	+7.3159999E+00	+7.2316493E+00
217.0	6	+7.5026645E+00	+1.5661292E-01	+7.7719993E+00	+7.3489999E+00	+7.3120174E+00
241.0	6	+7.3949937E+00	+4.7917542E-01	+8.1749992E+00	+6.9009990E+00	+7.4727525E+00

DISSECTED MTR, STAGE 1, TP-11011, SOL GEL, PERCENT EXTRACTABLES,MOTOR=0012199.



DISSECTED MTR. STAGE 1. TP-H1011. SOL GEL. WT SWELL RATIO MOTOR=0012199.

Figure 41

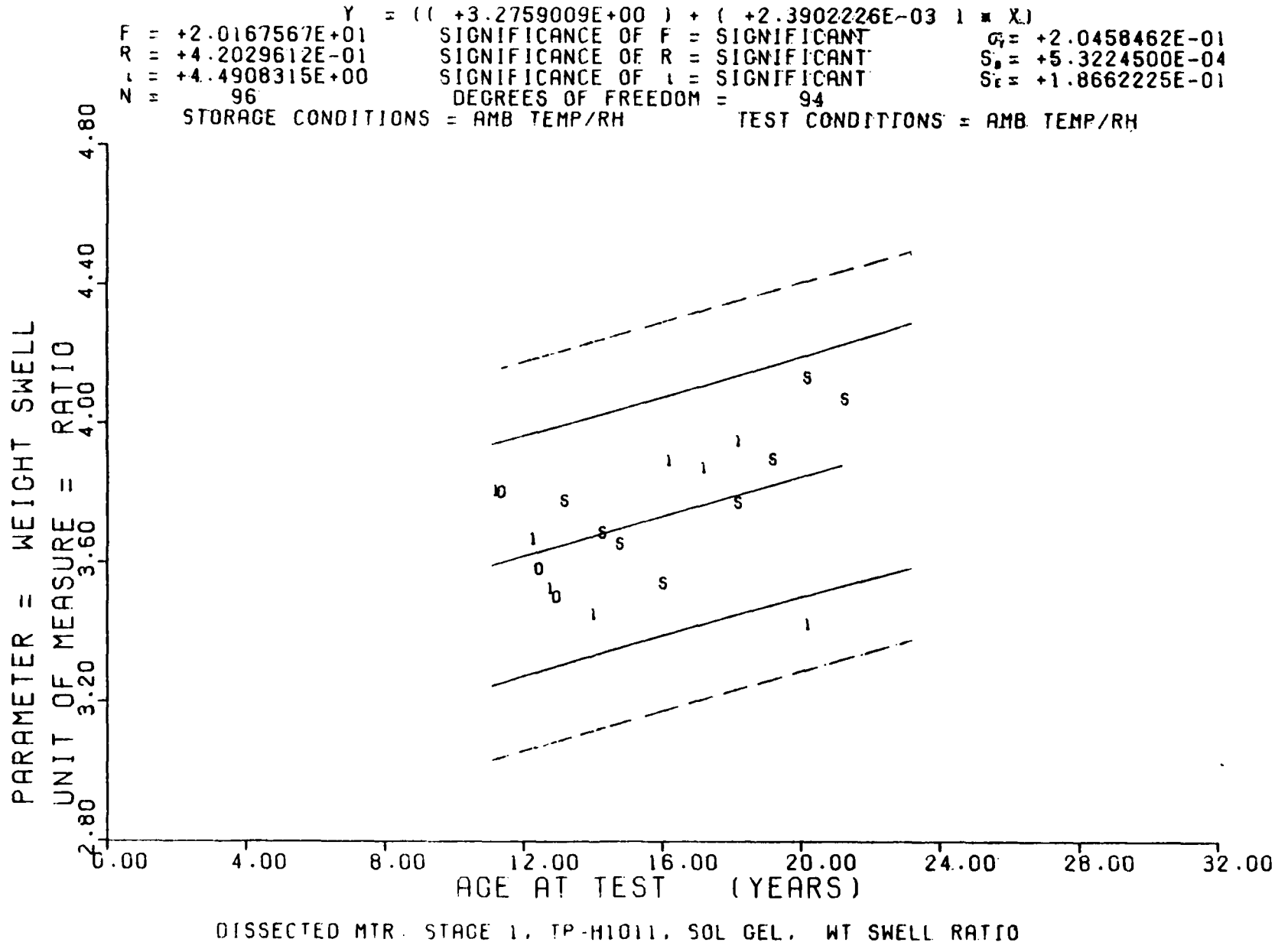

Y = ((+3.2759009E+00) + (+2.3902226E-03) * X)
F = +2.0167567E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = +4.2029612E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +4.4908315E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 96 DEGREES OF FREEDOM = 94
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = WEIGHT SWELL
UNIT OF MEASURE = RATIO
2.80
3.20
3.60
4.00
4.40
4.80
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
DISSECTED MTR STAGE 1, TP-H1011, SOL GEL, WT SWELL RATIO

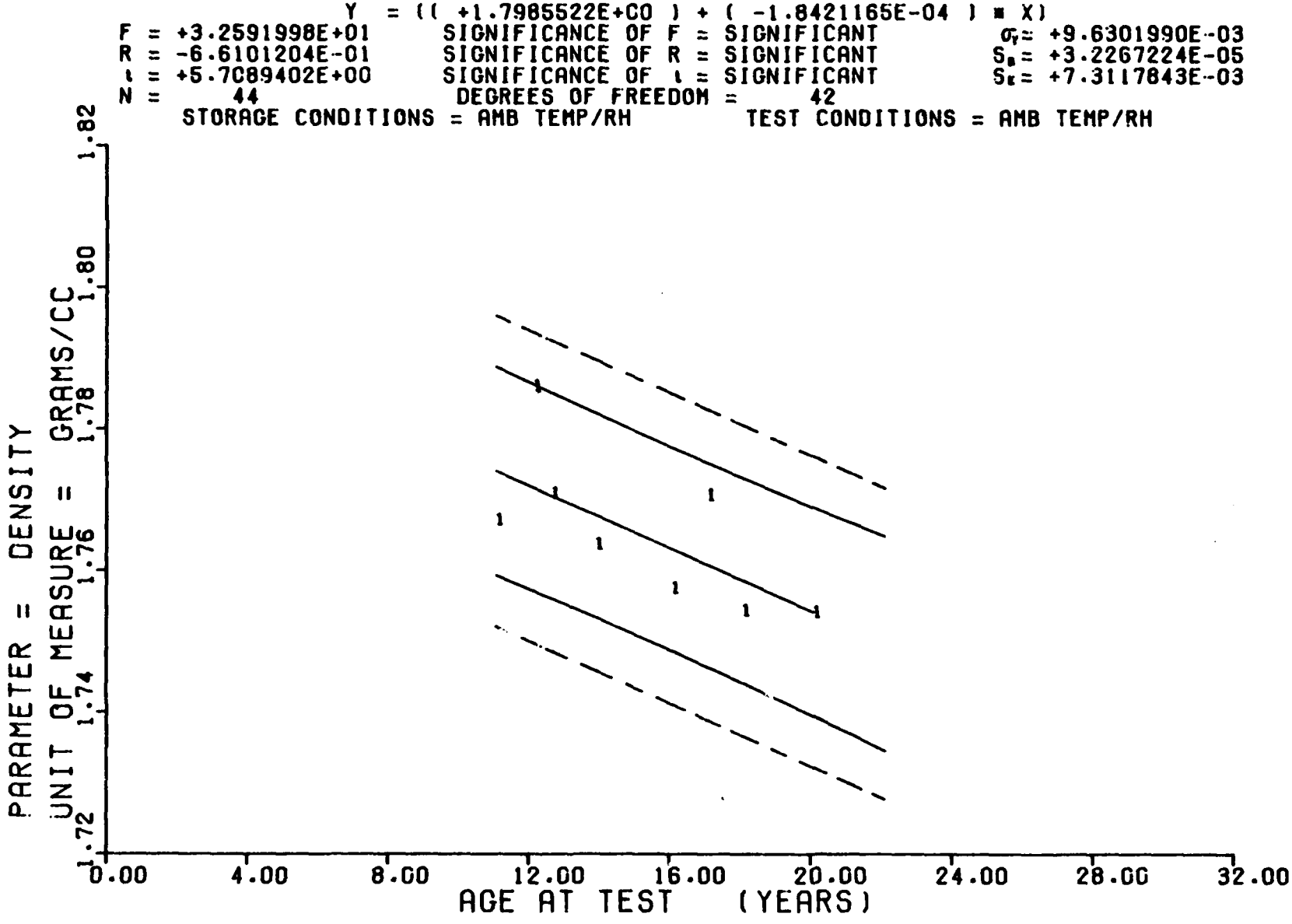
Figure 41A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

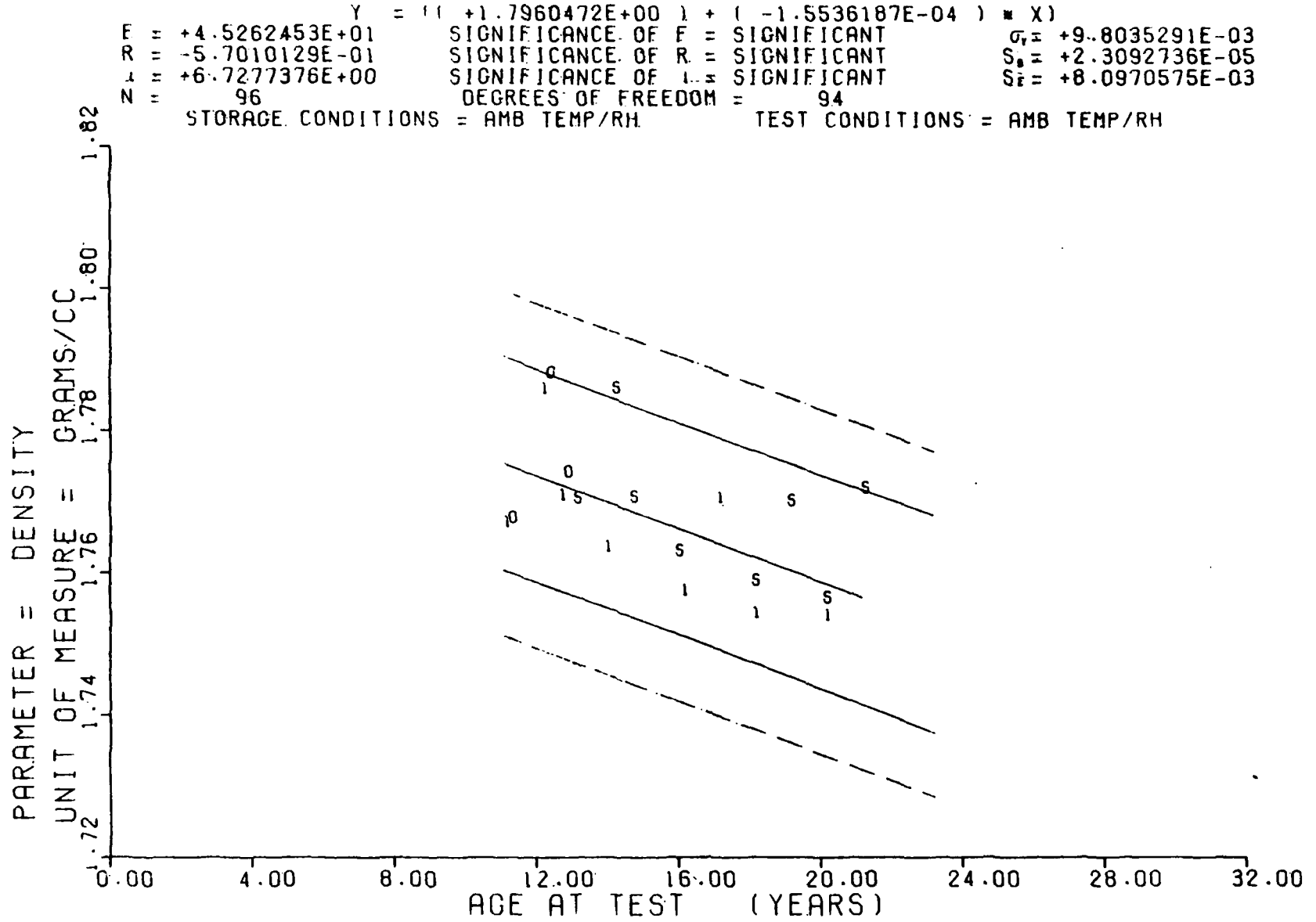
AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
133.0	4	+3.7952489E+00	+1.9556498E-02	+3.8123998E+00	+3.7782993E+00	+3.6749200E+00
146.0	4	+3.6556491E+00	+1.8345124E-02	+3.6717996E+00	+3.6299991E+00	+3.6808786E+00
152.0	4	+3.5143241E+00	+1.4576364E-02	+3.5322999E+00	+3.4986991E+00	+3.6836290E+00
167.0	6	+3.4415149E+00	+4.1119079E-02	+3.4979991E+00	+3.3872995E+00	+3.6905040E+00
193.0	6	+3.3813648E+00	+1.1694931E-02	+3.3948993E+00	+3.3645992E+00	+3.7024211E+00
205.0	8	+3.3622207E+00	+1.8284965E-02	+3.3857994E+00	+3.3403997E+00	+3.7079210E+00
217.0	6	+3.9387738E+00	+2.0736040E-02	+3.9698991E+00	+3.8987998E+00	+3.7134208E+00
241.0	6	+3.4128313E+00	+2.6078100E-02	+3.4664993E+00	+3.3948993E+00	+3.7244215E+00

DISSECTED MTR, STAGE 1, TP-H1011, SOL GEL, WT SWELL RATIO MOTOR=0012199.



STAGE 1, DISSECTED MTRS, SOL GEL, DENSITY, MOTOR=0012199.

Figure 42



STAGE 1,DISSECTED MTRS=(0)0012099,(1)0012199,(S)STM-012. SOL GEL DENSITY.

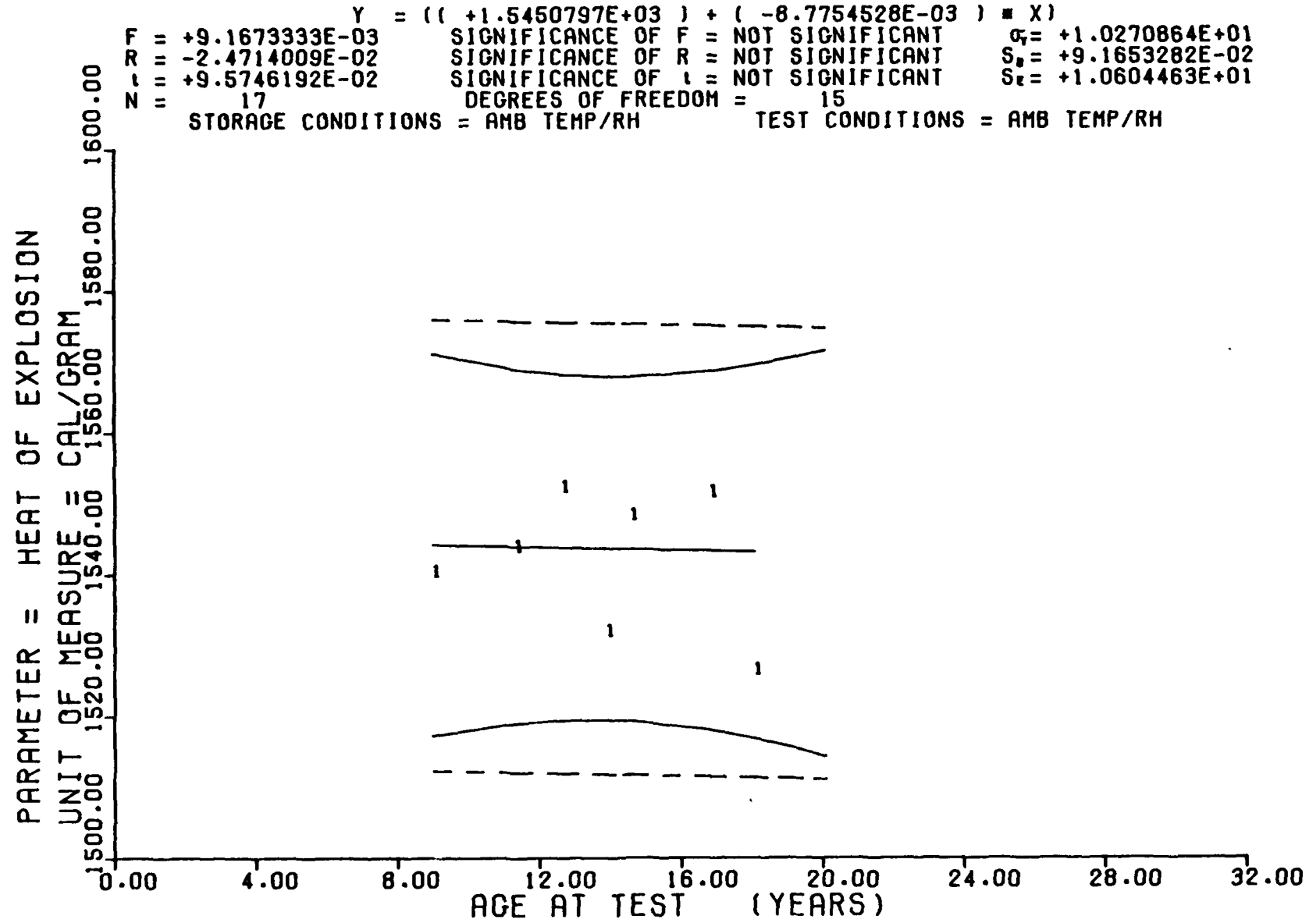
Figure 42A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

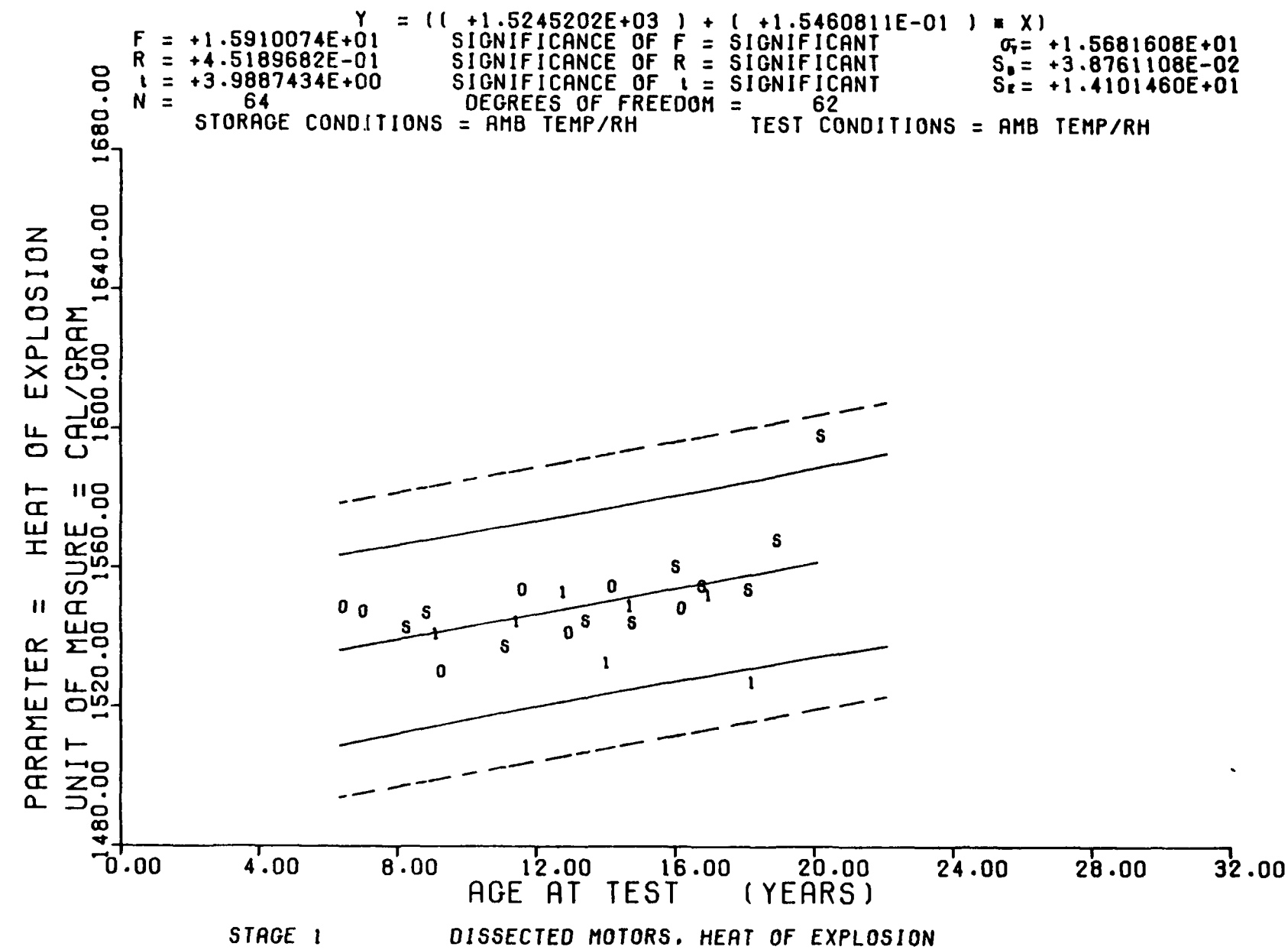
AGE (DAYS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
135.0	4	+1.7665243E+00	+1.4038670E-03	+1.7669992E+00	+1.7658996E+00	+1.7740516E+00
146.0	4	+1.7853746E+00	+1.4255590E-03	+1.7861995E+00	+1.7842998E+00	+1.7716569E+00
152.0	4	+1.7703237E+00	+1.6380530E-03	+1.7704992E+00	+1.7699995E+00	+1.7705516E+00
167.0	4	+1.7630653E+00	+1.2656602E-03	+1.7650995E+00	+1.7608995E+00	+1.7677888E+00
194.0	6	+1.7569160E+00	+1.2320693E-03	+1.7580995E+00	+1.7562999E+00	+1.7629985E+00
206.0	8	+1.7700366E+00	+1.1661441E-03	+1.7727594E+00	+1.7690992E+00	+1.7607879E+00
217.0	6	+1.7537488E+00	+2.4332323E-03	+1.7559995E+00	+1.7490997E+00	+1.7585783E+00
241.0	6	+1.7534829E+00	+2.1692241E-03	+1.7569999E+00	+1.7513999E+00	+1.7541570E+00

STAGE 1. DISSECTED MTRS. SOL GEL. DENSITY. (MOTOR=0012197).



STAGE 1. DISSECTED MOTOR=0012199, HEAT RELEASED AT IGNITION.

Figure 43



STAGE 1 DISSECTED MOTORS, HEAT OF EXPLOSION

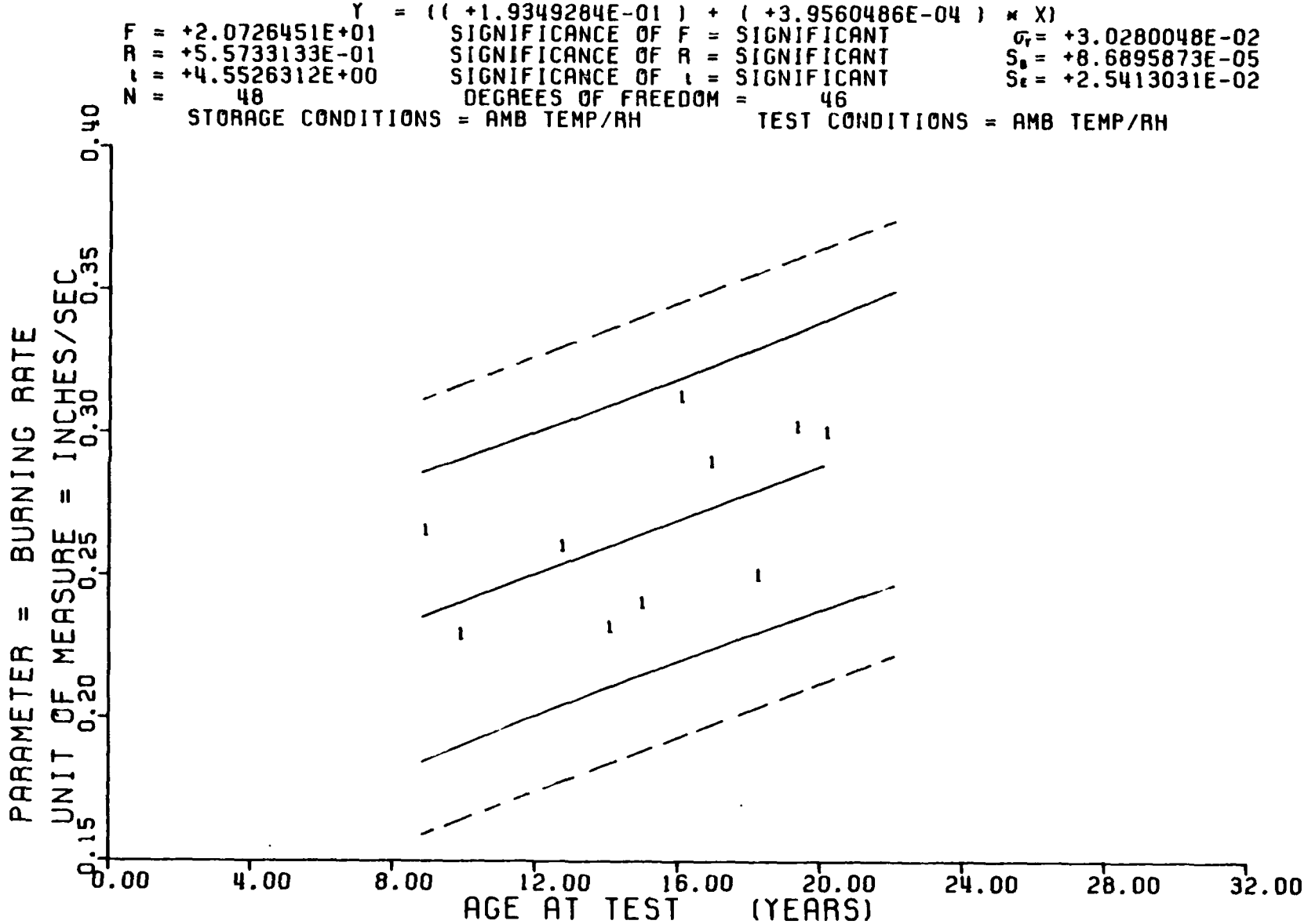
Figure 43A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
108.0	1	+1.5396999E+03	+0.0000000E+07	+1.5396999E+03	+1.5396999E+03	+1.5441318E+03
136.0	3	+1.5433320E+03	+2.3155942E+00	+1.5436999E+03	+1.5430998E+03	+1.5438862E+03
152.0	3	+1.5517656E+03	+3.3417963E+00	+1.5540998E+03	+1.5487998E+03	+1.5437458E+03
167.0	3	+1.5314660E+03	+1.3515407E+01	+1.5470000E+03	+1.5235998E+03	+1.5436140E+03
175.0	3	+1.5477329E+03	+7.1416034E+00	+1.5551999E+03	+1.5410998E+03	+1.5435439E+03
202.0	3	+1.5510324E+03	+3.8773143E+00	+1.5548999E+03	+1.5485000E+03	+1.5433068E+03
217.0	1	+1.5258999E+03	+0.0000000E+07	+1.5258999E+03	+1.5258999E+03	+1.5431752E+03

STAGE 1, DISSECTED MOTOR=0012199, HEAT RELEASED AT IGNITION.



STAGE 1, DISSECTED MOTOR= (1) 0012199, BURNING RATE AT 500 PSI INITIAL PRESSURE.

Figure 44

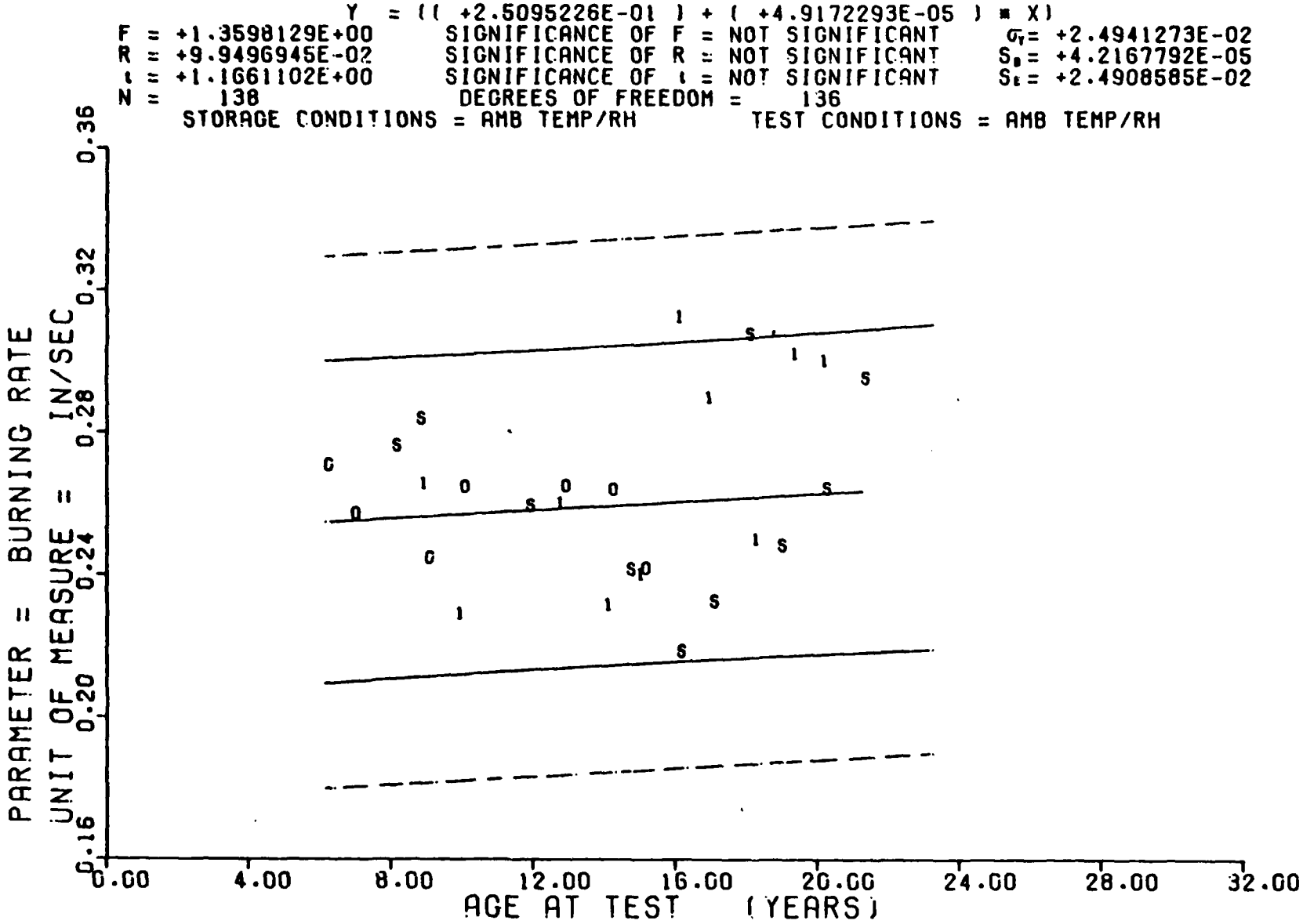

Y = ((+2.5095226E-01) + (+4.9172293E-05) * X)
F = +1.3598129E+00 SIGNIFICANCE OF F = NOT SIGNIFICANT σY= +2.4941273E-02
R = +9.9496945E-02 SIGNIFICANCE OF R = NOT SIGNIFICANT Sb= +4.2167792E-05
t = +1.1661102E+00 SIGNIFICANCE OF t = NOT SIGNIFICANT St= +2.4908585E-02
N = 138 DEGREES OF FREEDOM = 136
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = BURNING RATE
UNIT OF MEASURE = IN/SEC
0.36
0.32
0.28
0.24
0.20
0.16
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISCTED MTRS=(0)G012099,(1)G012199,(S)STM-012,BURNING RATE AT 500 PSI.

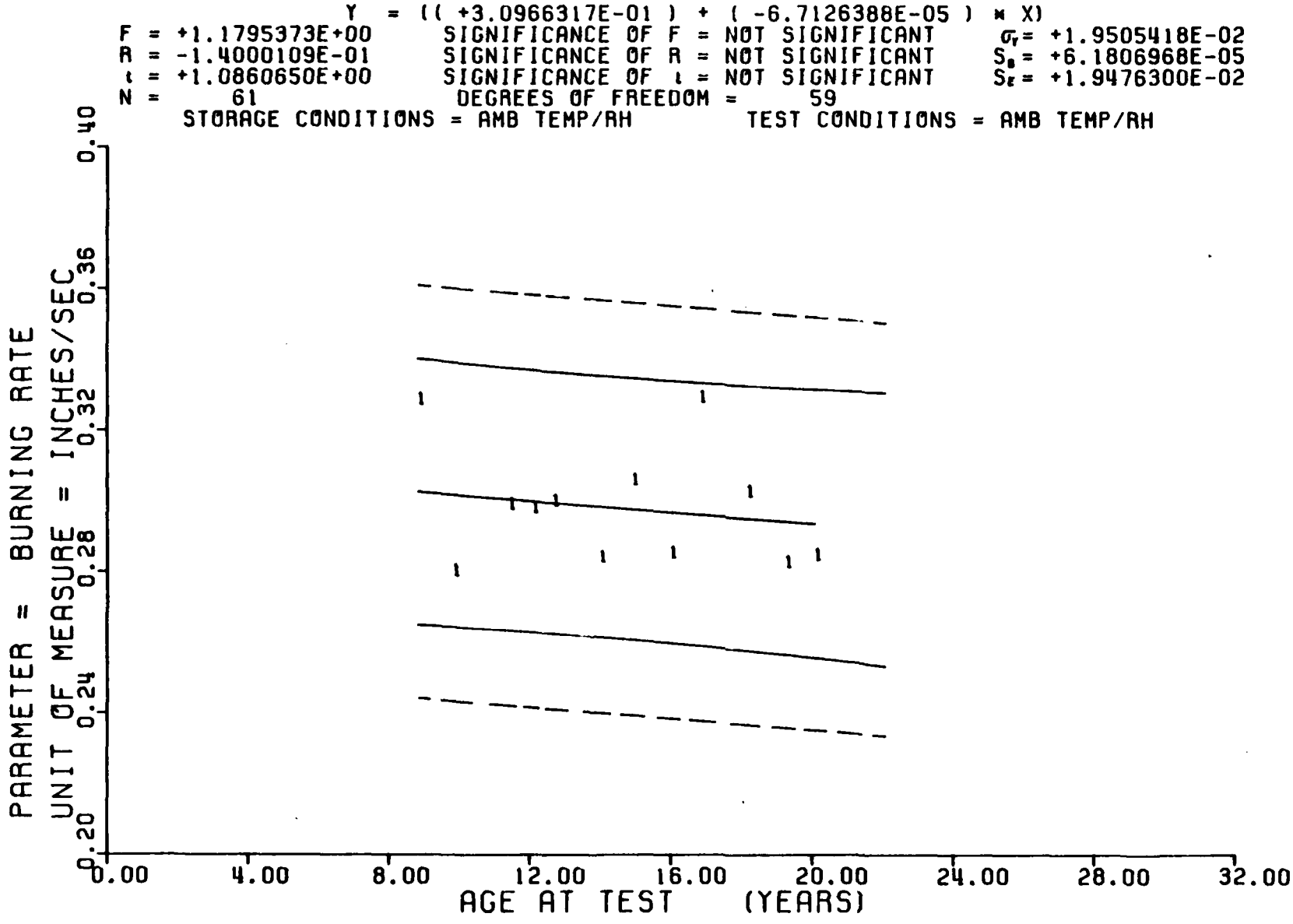
Figure 44A

**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+2.6419979E-01	+2.2954995E-03	+2.6799994E-01	+2.6199996E-01	+2.3542690E-01
118.0	5	+2.2779977E-01	+4.9807506E-03	+2.3299998E-01	+2.2199994E-01	+2.4017417E-01
152.0	6	+2.5866651E-01	+2.3098162E-02	+3.0199998E-01	+2.4399995E-01	+2.5362473E-01
168.0	6	+2.3033314E-01	+7.9696300E-03	+2.4099999E-01	+2.1799999E-01	+2.5995445E-01
179.0	6	+2.3883306E-01	+1.6439691E-02	+2.7199995E-01	+2.2999995E-01	+2.6430606E-01
192.0	3	+3.1109994E-01	+3.9502346E-03	+3.1509995E-01	+3.0719995E-01	+2.6944893E-01
202.0	6	+2.8833305E-01	+6.8120872E-03	+2.9499995E-01	+2.7799999E-01	+2.7340501E-01
218.0	3	+2.4866664E-01	+1.1518481E-03	+2.5000000E-01	+2.4799996E-01	+2.7973467E-01
231.0	3	+3.0066663E-01	+3.0529920E-03	+3.0399996E-01	+2.9799997E-01	+2.8487753E-01
241.0	5	+2.9875981E-01	+4.3638794E-03	+3.0619996E-01	+2.9479998E-01	+2.8883355E-01

STAGE 1,DISSECTED MOTOR=(1)0012199,BURNING RATE AT 500 PSI INITIAL PRESSURE.



STAGE 1,DISSECTED MOTOR=(1)0012199,BURNING RATE AT 1000 PSI INITIAL PRESSURE.

Figure 45

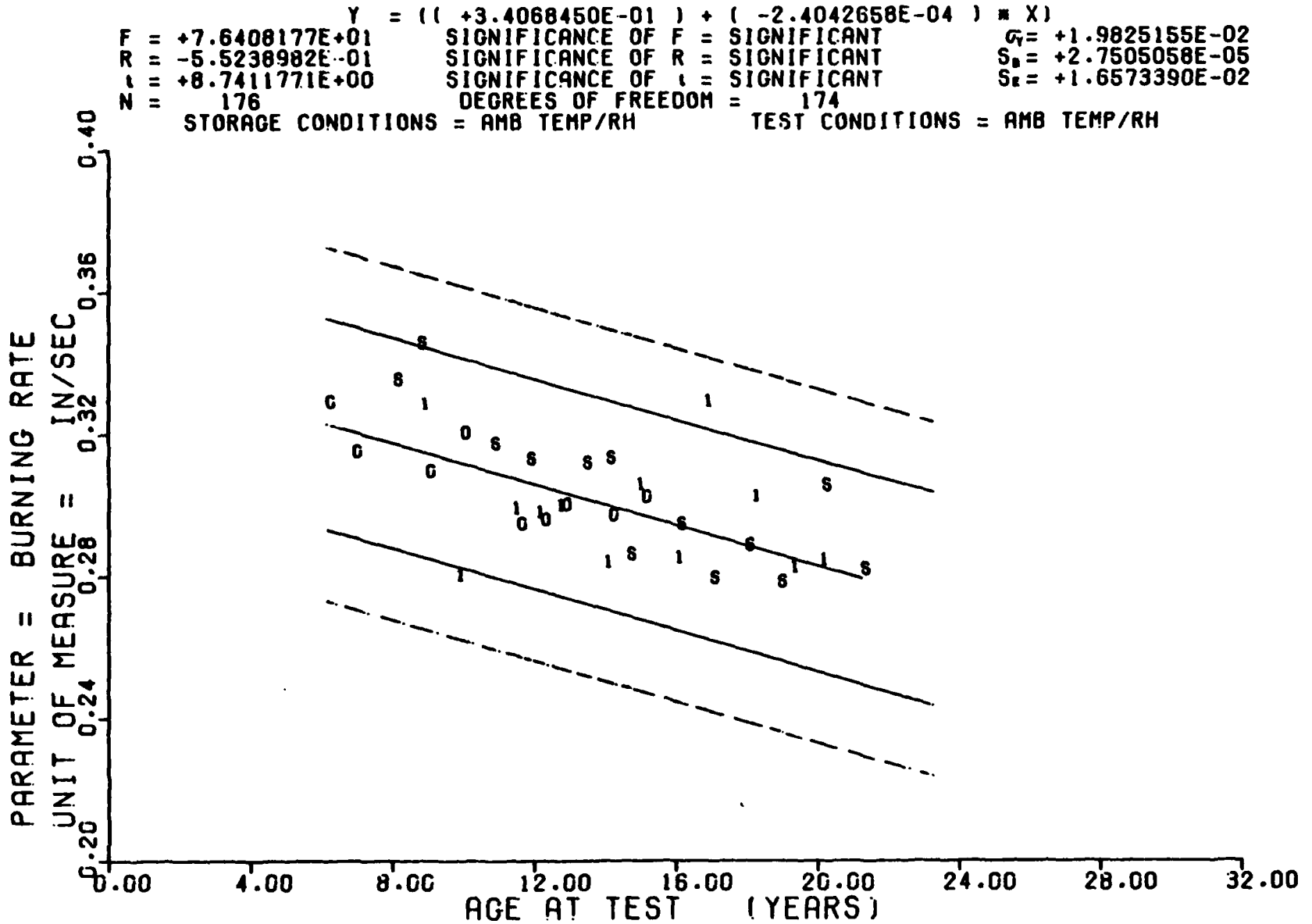

Y = ((+3.4068450E-01) + (-2.4042658E-04) * X)
F = +7.6408177E+01 SIGNIFICANCE OF F = SIGNIFICANT
R = -5.5236982E-01 SIGNIFICANCE OF R = SIGNIFICANT
t = +8.7411771E+00 SIGNIFICANCE OF t = SIGNIFICANT
N = 176 DEGREES OF FREEDOM = 174
STORAGE CONDITIONS = AMB TEMP/RH TEST CONDITIONS = AMB TEMP/RH
PARAMETER = BURNING RATE
UNIT OF MEASURE = IN/SEC
0.40
0.36
0.32
0.28
0.24
0.20
0.00
4.00
8.00
12.00
16.00
20.00
24.00
28.00
32.00
AGE AT TEST (YEARS)
STAGE 1 DISCTED MTRS=(0)0012099,(1)0012199,(S)STM-012,BURNING RATE AT 1000 PSI.

Figure 45A

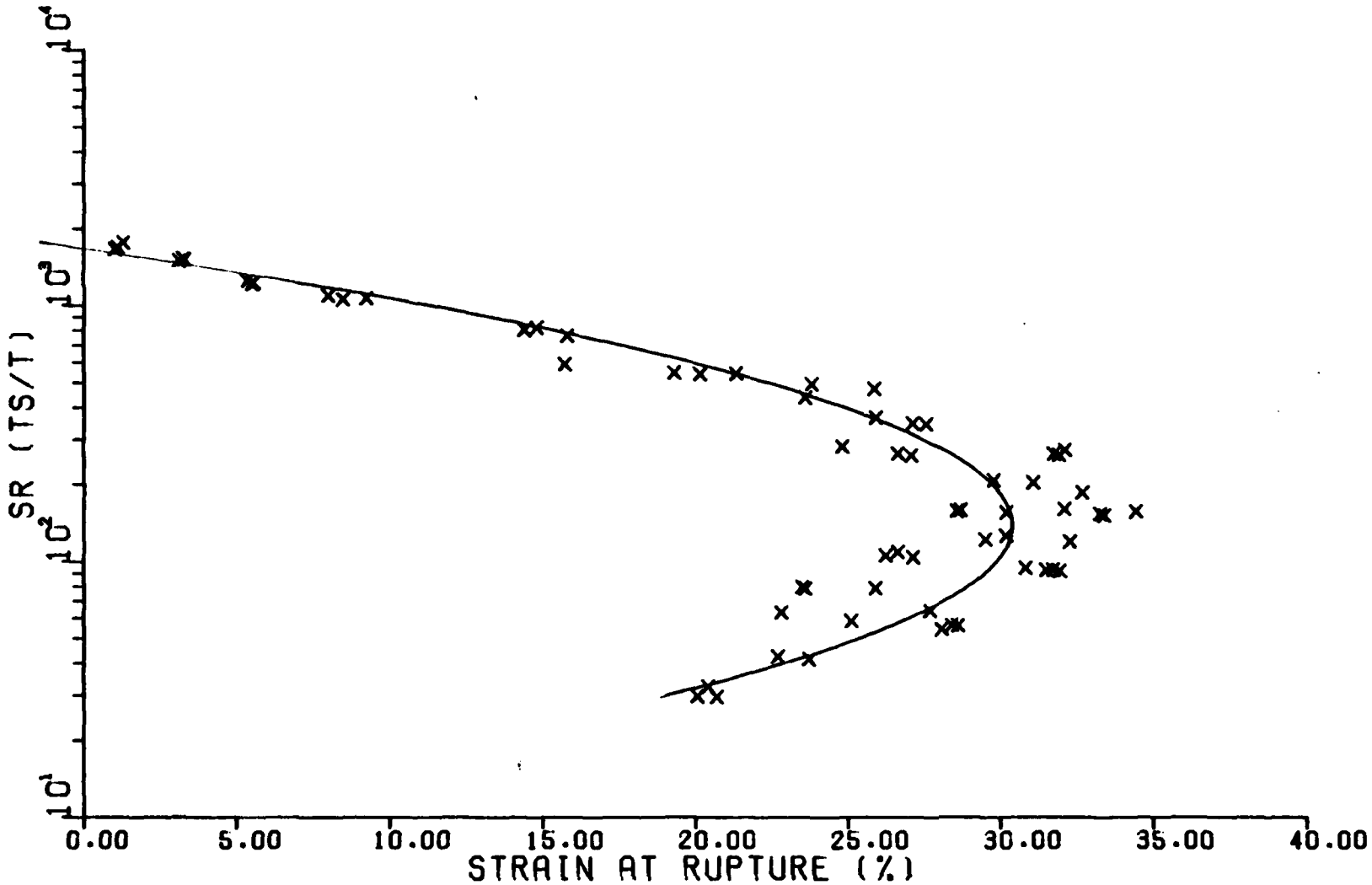
**** LINEAR REGRESSION ANALYSIS ****

*** ANALYSIS OF TIME SERIES ***

AGE (MONTHS)	SPECIMENS PER GROUP	MEAN Y	STANDARD DEVIATION	MAXIMUM Y	MINIMUM Y	REGRESSION Y
106.0	5	+3.2739979E-01	+5.4671778E-03	+3.3199995E-01	+3.2099997E-01	+3.0254775E-01
118.0	5	+2.7899968E-01	+7.4953729E-03	+2.8799998E-01	+2.7199995E-01	+3.0174225E-01
137.0	8	+2.9787468E-01	+4.1430658E-03	+3.0399996E-01	+2.9399996E-01	+3.0046683E-01
145.0	6	+2.9683303E-01	+4.5541523E-03	+2.9999995E-01	+2.8799998E-01	+2.9992979E-01
152.0	5	+2.9879987E-01	+1.4909735E-03	+3.0099999E-01	+2.9699999E-01	+2.9945993E-01
168.0	6	+2.8283292E-01	+9.2733389E-03	+2.9499995E-01	+2.7299994E-01	+2.9838591E-01
179.0	6	+3.0466634E-01	+3.3341548E-02	+3.6399996E-01	+2.7799999E-01	+2.9764753E-01
192.0	3	+2.8406661E-01	+2.0050004E-03	+2.8629994E-01	+2.8239995E-01	+2.9677486E-01
202.0	6	+3.2799971E-01	+1.0514737E-02	+3.3899998E-01	+3.1199997E-01	+2.9610359E-01
218.0	3	+3.0133324E-01	+2.3112752E-03	+3.0399996E-01	+2.9999995E-01	+2.9502958E-01
231.0	3	+2.8133326E-01	+5.6340067E-04	+2.8199994E-01	+2.8099995E-01	+2.9415696E-01
241.0	5	+2.8339976E-01	+1.1142458E-03	+2.8499996E-01	+2.8229999E-01	+2.9348570E-01

STAGE 1,DISSECTED MOTOR=(1)0012199,BURNING RATE AT 1000 PSI INITIAL PRESSURE.

TEMPERATURE CORRECTED FAILURE ENVELOPE



FAILURE ENVELOPE RANGE: 84001 TO 84365 (MOTOR S/N 0012199)

Figure 46

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		6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) JOHN A. THOMPSON		8. CONTRACT OR GRANT NUMBER(s)
9. PERFORMING ORGANIZATION NAME AND ADDRESS Propellant Analysis Laboratory Directorate of Maintence Hill AFB, UT 84056-5149		10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS
11. CONTROLLING OFFICE NAME AND ADDRESS Service Engineering Division Directorate of Materiel Management Hill AFB, UT 84056-5149		12. REPORT DATE March 1985 13. NUMBER OF PAGES 162
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19. KEY WORDS *(Continue on reverse side if necessary and identify by block number)*

Minuteman
Solid Propellant
Dissected Motor

20. ABSTRACT *(Continue on reverse side if necessary and identify by block number)*

Testing was performed to determine the useful shelf/service life for LGM-30 Stage I Rocket Motors. A three year storage program for propellant and components was started in May 1961. This program was then extended to a ten year study and later continued indefinitely to assure that a deterioration in motor physical characteristics could be detected in time to take some corrective actions before the weapon system performance deteriorated below an acceptable level.

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SECURITY CLASSIFICATION OF THIS PAGE *(When Data Entered)*

This report covers propellant test data for motor S/N 0012199. Planned dissection of selected motors in the future will provide samples for continued component testing.

The data is presented in the form of regression analysis and the trends are projected 24 months beyond the last test date.

From the statistical analysis of all data tested to date, significant degradation of the propellant does not appear likely for at least two years past the oldest test point.

Future testing and reporting will be conducted on individual dissected motors.

END

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